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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. Articles written by Mr. RAYMOND will be signed thus *

Business communications for the Western Department should be addressed to the Western Office at Denver, Colo.

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AMERICAN INSTITUTE OF MINING ENGINEERS.

[OFFICIAL BULLETIN.]

The October meeting of the Institute will be held in Amenia, Dutchess County, N. Y., beginning Tuesday evening, October 23, at 8 o'clock. The following programme has been suggested by the local committee of arrangements:

Tuesday evening: Session for reading and discussion of papers. Wednesday morning: Excursion to mines and furnaces about Amenia. Wednesday afternoon and evening: Sessions. Thursday: Excursion to Irondale, Copake Furnaces and Mines, Bashbish Falls, and Mount Washington; session in the evening. Friday: Excursion to Phœnix Furnace, Salisbury Mines, Twin Lakes, and Canaan Furnace. Saturday: Excursions to Richmond Mines and Furnace, breaking up on the Boston & Albany Railroad, in a good position to go East, West, or South.

The following gentlemen have consented to act as Local Committees at the different localities to be visited: Gov. A. H. Holley, Lakeville, Conn.; Hon. W. H. Barnum, Lime Rock, Conn.; Noah Gridley, Amenia, N. Y.; George H. Swift, Amenia, N. Y.; Edward Gridley, Amenia, N. Y.; Col. Walter L. Phelps, Irondale, N. Y.; Frederick Miles, Copake, N. Y.; Milo B. Richardson, Amenia, N. Y.; C. W. Barnum, Lime Rock, Conn.; Dr. H. M. Knight, Lakeville, Conn.; H. Landon, Chapinville, Conn.; N. C. Ward, East Canaan, Conn.; John H. Coffin, Van Deusenville, Conn.; Col. George Church, Great Barrington, Mass.; J. W. Hoysradt, Hudson, N. Y.; Milton Robbins, Richmond, Mass.; A. J. Copp, Millerton, N. Y.; W. W. Kniffin, West Stockbridge, Mass.; John Hopson, Kent, Conn.; James F. Lewis, Amenia, N. Y.

It is desirable that members should give early notice to Mr. J. F. LEWIS, of Amenia, or to the Secretary, of their intention to attend the meeting.

Amenia is on the Harlem Railroad, and is reached by trains from New York, leaving at 10.30 A. M. and 3.50 P. M., arriving at 1.40 and 7.20 P. M. Members coming from the North, East, and West connect with the Harlem road at Chatham Four Corners on the Boston & Albany Railroad, where trains leave at 5.45 A. M. and 4. P. M., arriving at Amenia at 7.30 A. M. and 5.30 P. M. There are ample hotel accommodations in Amenia.

EASTON, Pa., Oct. 16, 1877. T. M. DROWN, Secretary.

The review of the Delaware & Hudson Canal Company's report, re-published in pamphlet form, will be ready for delivery the coming week. Orders should be sent in immediately.

In our Iron Market Review this week will be found the first public announcement of the details of a proposed combination of our steel rail works. It is needless to say the object of this is to increase prices. The views of this JOURNAL on trade combinations of this kind are well known. We believe them immediately injurious to the public, and ultimately injurious to the industry adopting them. We shall defer to another occasion a full discussion of this particular arrangement in its bearing on both the public at large and the trade.

We last week announced with great satisfaction that Mr. H. S. DRINKER's book on tunneling is about to be published by Messrs. JOHN H. WILEY & SONS, of this city. American engineers have waited impatiently for its appearance since it was first announced that Mr. DRINKER was engaged upon it. But we think the comprehensive and thorough nature of the work will lead its readers to wonder, not that it has been delayed so long, but rather that it has been completed so soon. It is not a mere compilation, but a treatise, in which an immense amount of material is collected, arranged, discussed, and by judicious deductions, criticisms, and suggestions made available both to the student and to the practitioner. Reserving a more detailed notice until the volume shall appear, we append the titles of the chapters, in which the tables alone cover the data obtained from more than 1.700 tunnels and adits in this and other countries. It will be seen that many of these subjects are equally involved in all mining operations, so that, for a large part of mine engineering, the book will be the latest and best of manuals. The topics are: The History of Tunneling, from the Time of the Egyptians to the Present Day; The History of Explosive Compounds; Modern Explosive Compounds; The Principles of Blasting; Power Drills and Air Compressors; Examples of the Application of Power Drills in the Six Leading Modern Tunnels—the Nesquehoning, Musconetcong, Hoosac, Sutro, Mt. Cenis, and St. Gothard; European Tunneling Systems, Described and Criticised; The American System; Tunnel Centers; Tunnel Masonry; Systems of Iron Support in Tunneling; Shafts; Tunnels Built in Open Cuts; Reconstruction and Enlargement of Tunnels; Breaks and Falls in Tunneling; Subaqueous Tunneling; The Normal Cross-section; Geological Questions affecting Tunneling; Tunnel Surveying; Tunnel Ventilation; The Cost of Tunneling.

For the conception and execution of such a work as this, Mr. DRINKER deserves our thanks no less than our congratulations. *

NEW PUBLICATIONS.

The address of Prof. O. C. MARSH, of Yale College, on "The Introduction and Succession of Vertebrate Life in America," delivered before the American Association at Nashville, on the 30th of August, is a masterly summary of the work thus far accomplished in American paleontology; and forms incidentally an interesting companion-piece to the recent address of CLARENCE KING, whose conclusions were drawn chiefly from stratigraphic and dynamic geology. Mr. KING's biological theory is, however, relegated to its proper subordinate place as a part of the Darwinian evolution. Says Prof. MARSH:

"As a cause for many changes of structure in mammals during the Tertiary and Past-Tertiary, I regard, as the most potent, *Natural Selection*, in the broad sense in which that term is now used by American evolutionists. Under this head, I include not merely a Malthusian struggle for life among the animals themselves, but the equally important contest with the elements, and all surrounding nature. By changes in the environment, migrations are enforced, slowly in some cases, rapidly in others; and with change of locality must come adaptation to new conditions, or extinction. The life-history of Tertiary mammals illustrates this principle at every stage, and no other explanation meets the facts."

We notice that Prof. MARSH, like Mr. KING, explains the "almost total absence" of remains of fishes from the Miocene lake-basins of the West, by the theory (which he says is, "perhaps, the best") that "these inland waters, like many of the smaller lakes in the same region to-day, were so impregnated with mineral matters as to render the existence of vertebrate life in them impossible." This theory seems to involve the conclusion that the Miocene lakes had no outlets. There are no lakes, large or small, with which we are acquainted in the West, which, having outlets, are thus impregnated with mineral matter. Utah Lake, deriving its water from the same country which furnishes the supply to the Great Salt Lake, is fresh, and swarms with trout. Even the sink of the Humboldt, which has no outlet except the seepage of its waters under the surface for some distance further down the valley, is but slightly brackish. But if the Miocene lakes were entirely without drainage, and therefore saline, why is the absence of the remains of fishes not total, but only "almost total?" One fossil fish, we should think, would be a troublesome fact for this theory, unless, indeed, it be assumed that the individual lived in a river by choice, and found his way unwillingly to a lacustrine sepulcher. A paucity of fishes might, perhaps, be accounted for by the otherwise probable supposition that the Miocene lake outlets found their way over precipitous cataracts to the sea. The Columbia and the Colorado river-systems show the remains of such escarpments plainly enough.

When LEWIS first came from the East upon the upper waters of the Snake, and found neither salmon in the river nor the knowledge of them along its banks, he inferred that either the stream did not empty into the Columbia, or else there were large falls between him and its mouth. Assuming the absence of fishes in the Miocene lakes, have we not the same option as to an explanation?

But we did not intend to discuss this point at length. It is only one of many interesting inquiries suggested by Prof. MARSH's pregnant addresses. *

NEW CONSTRUCTIONS IN GRAPHICAL STATICS. By HENRY T. EDDY, C. E., Ph.D., Professor of Mathematics and Civil Engineering in the University of Cincinnati. Reprinted from *Van Nostrand's Engineering Magazine*. New York: D. Van Nostrand. 1877. 8vo., 62 pp. text. Six folding plates. Price $1.50.

Professor EDDY here presents concise discussions of the principles of equilibrium in arches, continuous and suspension bridges, retaining walls and domes. Nearly one half of the book is devoted to metal arches, structures which,

although rarely built, are of considerable interest to the engineering profession. Mohr's theorem concerning the identity of the equilibrium polygon and the elastic line is here applied in an original manner to the determination of artificial moments due to the form of the arch, and from these the existing moments due to the applied loads are deduced. Considerable space is devoted to the continuous girder of variable cross section—a problem of more interest to mathematicians than to engineers. It is so difficult to find anything on the subject of domes in our language that the thorough discussion of their theory here given will be gladly welcomed. The drawings are clear and methodical, and the expressive system of lettering employed greatly facilitates their use in connection with the text.

Graphical statics is particularly valuable in three directions. To the engineer it furnishes methods for the numerical solution of questions concerning the stability of structures; to the student it gives clear conceptions of the effects and relations of the forces which enter his static problems; and to the mathematician it is an instrument for investigation and research. For our own sake we could have wished that Professor EDDY had dwelt more upon the engineering side of the subject, and we cannot but think that a statement concerning the best scales to use in the practical investigation of problems, a discussion of the degree of precision attainable by the graphic process, or an exhibition of the numerical results arrived at in his solution of the St. Louis arch, would have given added interest to the book. Professor EDDY has worked mainly for advanced students of these special engineering structures. To them and to future investigators his new constructions will be of great value. It is to be regretted that the publisher should see fit to devote nearly one half (44 pages out of 106) of this book to advertisements. Every one would prefer to have these in a separate volume, and most persons will object to having to purchase such matter when they want only graphical statics.

SUMMER TRIPS AMONG THE MINES—No. 6.

Staff Correspondence of the Engineering and Mining Journal.

The price of mines has advanced between nine and eleven hundred per cent. in this camp since last night. Ordinary prospect holes which, yesterday, could be bought for $25, are now held at $500 to $600. Fair-looking veins with a couple of twenty-foot shafts on them, one of which might perhaps show a neat little seam of ore, and which, last week, would have been assessed by their owner at a couple of hundred dollars, cannot be looked at, now, under $5,000, while more developed mines, showing one or two exposures of a fine ledge, which, but for the poverty and indolence of their owners, might be producing a hundred dollars daily, have advanced in value with startling celerity, since sunrise, from $500 and $1,000 up to $25,000 and $50,000. And yet there has been no new discovery, no earthquake. But the foundations of Montezuma have been shaken to their center, like the Halls of the ancient Mexican capital when the Spaniards appeared in its vicinity, for a party of six capitalists has entered the town on horseback, and every man in the district, who yesterday had a mine for sale at figures which threatened the industry with abject ruin, is, this evening, so terrified lest some one of these capitalists is about to buy his mine, that he has raised his price to a figure which is limited only by the estimate of the length of the visitors' purses.

It is a curious camp, this Montezuma. As I approached the doorway of the one store of the town, a rather stout but handsome and energetic-looking woman was standing on the porch regarding with visible contempt a group of ragged, dirty miners, who, ranged side by side against the log building, were lazily smoking away their valuable time. Her fine strong face showed in its deep lines years of hard and monotonous labor on the frontier, such as comes to the pioneer woman alone. As she gazed on, one of the idlers looking stupidly at the heavy cloud which rested on the sharp peak of Glacier Mountain said, "There'll be a storm to-morrow, boys, and then good-by to this fine weather; we'll have two feet of snow in the gulch in ten hours. How can a poor devil of a miner make anything in this country?" "I'll tell ye how," broke in the woman, her magnificent contempt finding utterance at last, "if the gulch were swept from end to end, and every man like ye there against the logs like so many Greasers (half Indian and half Mexican) were cleaned out into the valley, the camp would liven up. There wouldn't be above ten decent men left in the town, but they'd do more than a hundred like ye."

It was rather a cutting criticism, but nevertheless true. A social upheaval is needed in Snake River district. If nine-tenths of all the old settlers and four-fifths of all the new-comers were shipped down the cañon into the Middle Park and drowned in the hot sulphur springs, though the transaction might ruin the park, it would benefit Montezuma. A less energetic and more lazy mining camp does not exist. The stranger, coming into town at any time during the summer, finds all the inhabitants sitting around the saloons smoking, and bewailing the inaccessibility of the place. The monotony of the day is broken only by meal time. On the mountains it is difficult to find a laborer, though the hills are ribbed with magnificent silver veins. The Montezuma miner, having found a lode, scratches along its surface till a spot is found where the mineral crops out in good body. Here he spends a week's labor in digging away the dirt from the ore, carefully abstaining from breaking off a pound of the latter. This done, his mission in life is apparently ended, and so long as the hotel keeper will credit him with board, and the saloon keeper will extend similar courtesy on account of whisky, he whiles away his life in delicious ease, and patiently waits for the coming capitalist, who is to make him a millionaire.

Snake River District lies directly at the foot of the dividing ridge of the continent, nineteen miles west of Georgetown. Connecting it with the latter town is a toll road, which covers the divide at Argentine Pass, attaining at the summit a height of 13,000 feet. This road is passable only five or six months of the year, owing to the snows which fall so deeply at that altitude, and as a consequence the district is almost cut off from communication during the remainder of the year, its only other outlet being by a long and circuitous road leading through the lower Snake Valley and up the Burr to another and much lower pass. Consequently, from time immemorial, the settlers of the district have been earnestly looking for another and shorter road to the plains, and when one was found to be practicable, which led across Handcart Divide to the little post-office at Grant, on the South Platte, there were hopes that the district would advance. But the customary and wonderful sluggishness of its inhabitants has allowed season after season to pass without a stroke of work being performed on the new road.

Amid all this inaction, it is encouraging to find a few mine owners who have had energy enough to open their mines, regardless of the difficulties which really beset mining at that altitude. Snake River District is in reality a fine one. Its mines are large, rich, and productive, and the half is not known as yet of their capabilities. Among the working and valuable properties are the S s John mines, the Cashier and Champion, the Tiger, the Morgar, the Blanche, and a few others.

At the St. John mines only a few men are at present working. The tunnel is, however, being pushed ahead, and No. 5 vein, which is considered now as the Comstock, is being further opened. The reduction works are not running, because the development on the veins under work is not as yet sufficient to keep them constantly employed. The works are, however, in perfect order, and were run very satisfactorily for a short time last year. Ore is steadily accumulating on the ore dumps, and it is possible that a run may be made during the winter.

The troubles existing between the Champion and Cashier mines have been satisfactorily settled to the advantage of each. The Champion tunnel has recently cut a vein of lead ore which, on further exploration, may turn out to be of great value. The tunnel is being pushed ahead vigorously to the main lode. The Cashier is in magnificent pay, and presents one of the finest-looking interiors that we have examined for some time.

Work on the Tiger Extension, for the season, has just closed, as the owners are unable to undergo the heavy cash outlays in provisioning the mine for the winter. The summer's work has consisted in driving an adit from the hillside on the vein. This has been pushed on forty feet, and has developed a fine-looking vein of ore, which, however, is not yet entirely in place. Above this adit there are a number of shallow openings on the course of the vein, all of which show a strongly mineralized lode, and it is a pity to see so good prospects lying idle.

In these remote districts, where the cost of living is high, and the necessities, not to speak of the conveniences of life, hard to obtain, the development of a quartz mine from the condition of a prospect hole having absolutely no value to that of a mine worth something, is, of course, a matter of time, labor, and hardship. The extreme altitude and the shortness of the season operate most disadvantageously with the man of small means. But in looking over the mines in Snake River District, upon which a reasonable amount of work has been done, few, if any, can be found which have not given evidence of their true value.

MONTEZUMA, COLO., , 1877.

THE SLIDE MINE COMPANY, GOLD HILL, COLORADO.

[WITH SUPPLEMENT.]

Staff Correspondence of the Engineering and Mining Journal.

The Slide lode, which is handsomely illustrated in the supplement accompanying this issue, belongs to the Telluride belt of veins, and is located on the northern slope of Gold Hill, Colorado. It was pre-empted in July, 1875, the title embracing 1,500 feet of the lode, being 750 feet each way from the discovery shaft. The claim is 150 feet in width. The town of Boulder on the plains is only ten miles distant, and the mining camps of Gold Hill and Sunshine respectively one-half and one and one-half miles. With all three it is connected by good wagon roads. Within a radius of five miles are four concentrating establishments, and at Boulder is a smelting works and sampling mill. The grade from the mine to these markets for ore is all downwards.

The vein lies between metamorphic gneiss and a dike of porphyry, bears diagonally across the hill, thus affording excellent opportunity for opening by means of adit levels, and ranges in width from four to ten feet, presenting several pay streaks, and having all the indications of a heavily mineralized fissure. The ore consists of free gold, tellurides of that metal and silver, and argentiferous and auriferous pyrites of iron and copper. The gangue is quartz. The product of the mine presents, therefore, no refractory characteristics, though in common with all ore a large portion of the mineral must be concentrated before smelting. In the working of the mine so far, this has been clearly shown, and is further proved by the record of other neighboring mines belonging to the same class.

Our illustration shows better than any verbal description could the openings on the vein. So far almost no stoping has been done, and nearly all the expenses of sinking and drifting have been paid out of the ore produced. This in itself is ample proof of the value of the vein.

The Corning Tunnel, which enters Gold Hill from its northern slope, 450 feet above its base, has cut what is believed to be the Slide Mine, 960 feet from its mouth, and at a depth of 500 feet below the surface. Here the vein shows a width of 14 feet, and is separated into anumber of seams, in all of which the ore

shows well, and of the same character as above. So far as may be judged by existing developments, the ore shows a tendency to cling to the foot wall, which is gneiss, but as the workings are pressed deeper, this will probably be changed to a more equal distribution of mineral, with a tendency, if there be any, to cling to the porphyry wall. Critical examination of the ore from this lode shows an unusual abundance of nugget gold of various sizes, from minute shots up to quite large lumps. Coupling this fact with other indications in and adjacent to the mine, there can be no doubt that the intrusion of the porphyry dyke which now forms one wall, occurred subsequently to the filling of the vein. Up to the present no barren ground has been found, though the openings have shown aggregations of mineral in chimneys and pockets, some of which are richer in free gold than in tellurides of that metal, others consisting wholly of pyrites or quartz, through which the tellureted minerals are disseminated, and others, again, showing a greater abundance of copper and iron pyrites. These variations being common to all metal mines are of value only as they are of interest. In the surface exploration of the vein it has been noticed that numerous feeders carrying a very good grade of ore (averaging $100 per ton) enter the vein from the west side and there end.

The gold products of the mine, previous to January 1, 1877, amounted to 46 tons, for which about $15,576 was paid. From that date up to August 1, 36 tons were sold, realizing $13,351. These figures are in coin, and indicate a value, per ton of ore, of $350. It is to be remembered that this was taken wholly from shafts and drifts. An examination of the diagram of the workings, given in our illustration, shows about 350 fathoms of stopes opened by existing development. As the mineral sold up to the present indicated a value per running fathom of over $200 (a running fathom being 36 square feet of the plane of the ledge), the value of the ground untouched, in first-class ore, may safely be calculated at $70,000. The books of the mine show that the total expenses of working the vein, up to August 1, 1876, were $5,044, corresponding to $62.50 per ton. These figures include smelting charges, transportation, and mining, and showed a small profit upon the development up to that date. Since then, the expenses having been somewhat heavier, and the policy of not touching the stopes is rigidly adhered to, the mine has run slightly behind.

Aside from the products here stated, a quantity of low grade mineral, estimated by its owners at 125 tons, having a gross value of $40 per ton, has been taken out. As is well known, the real wealth of a mine usually lies in its poorer grades, which, existing in large quantities, and being mined at a small cost, will ultimately, and in fact from the start, yield more, if properly handled, than the higher grades. None of this product has as yet been milled. At current rates in Colorado for reduction, it cannot be treated raw with profit, but must be previously concentrated to a value which will permit of the charges of the smelting works. This can be done now at any of the five custom concentrating mills in the vicinity. The transportation of the ore will cost $2.50 per ton, and the concentration $3 to $4. Allowing for a loss of 20 per cent. in the operation, the value of this portion of the product can be calculated at $3,150, which will bring, at the smelting works at Boulder or Black Hawk, $2,300. The ore will concentrate five tons into one.

Our supplement shows a section of Gold Hill by the Corning tunnel. This enterprise, which is of very great importance to the district, has been pushed ahead with vigor and persistency, and will immediately be the highway through which the mines of Gold Hill are worked. The veins already cut are indicative of success as soon as they are explored laterally; one of them in particular (the Bonanza) being a gigantic fissure well filled with low grade pyritiferous ore, which *can* be made a valuable property. Before the Slide vein was cut by the tunnel there were many who doubted whether the rich tellurides which have made the rich belt of the Colorado mines famous, would be found in depth. After its intersection this idea, though never presenting any real foundation for belief, must be given up. While it is quite certain that any and all metal veins will show at various depths different exhibitions as to quantity of ore, all present knowledge on veins of the fissure class, to which the Slide belongs, indicates that no material alterations in the quality of the mineral will be found, except such as may be fully accounted for by surface disintegration and alteration.

MINERAL RESOURCES OF THE BLACK HILLS.—I.

To the reader, whose patience has not already been exhausted by the numerous and often conflicting articles which have appeared in the secular press about the Black Hills, the following account may be of some interest: The story of to-day is not that of yesterday. The development of a country where gold exists in paying quantities advances with long and rapid strides. Hardly three years ago the elk and deer held almost undisputed possession of these wooded hills. The Indian cut his tepee poles in the foot hills, and was prevented only by his superstitions, engendered probably by the terrible display of the meteoric forces, from inhabiting the interior. To-day the miners and ranch man's cabin meet us at every turn. Cattle feed in the beautiful flower-bedecked parks. The gulches are torn up, and the hills pitted and tunneled by the gold-seeker. Deadwood Gulch, then an almost impassable waste of dead and fallen timber, is to-day one long succession of flourishing villages; while the steam whistle and the roar of stamps have broken the profound silence for which this country was so remarkable.

Though gold is found everywhere in the gulches and the veins, where the primary formations crop out, two years of exploration have developed only one flourishing and important gold district on Whitewood Creek and its tributaries, besides a silver district on Bare Butte Creek, not so well prospected, but giving promise of considerable richness. Rich placer diggings were discovered on Deadwood Creek, in December, 1875, and the city of Deadwood soon after sprang up at the junction of this creek with Whitewood Creek. These diggings, though rich, and yielding large fortunes, were not extensive, and people soon began to search for the fountain head, the source of all this wealth. What may be called the *immediate* source of the gold was soon discovered in a belt of conglomerate crossing Deadwood Gulch, two miles above the city. This belt consists of beds of quartz, pebble cemented by iron oxide, overlying the primary slates and schists, and in many places covered by later sedimentary beds, and by what has every appearance of an intrusive, eruptive porphyry. Beds of this cement are found everywhere in the hills, but only in the belt have they proved rich in gold. It possesses many curious geological features. The beds generally first dip into the hills, afterwards slowly ascend with their slope The cement varies in its physical properties. In places it is loose, and made of well rounded pebbles, while in others it is extremely firm and hard, having the appearance of homogeneous rock. When firm, it is often jointed, so that it may be quarried out in huge cubical blocks. Neither is the gold uniformly distributed, there being spots or channels of extreme richness, the best pay being on and near the slate bedrock. A great many assays have proved the quartz to be almost invariably barren, the gold being in the cementing material. I will postpone any theories regarding the geology of the formation, until further facts are brought to light by the many tunnels penetrating the hills. Without doubt, their formation alone will insure the prosperity of the camp for years to come.

Simultaneous with the discovery of these deposits, gold-bearing veins were discovered in the slate, which constitutes the oldest formation in the Hills. Curious enough, it is only in a limited belt, underlying and wider than the cement belt, that these quartz veins bear gold in paying quantities. They vary in width from narrow streaks, everywhere interlaminated with the slate, to immense lodes, many feet in width, in many places conformable with, in others cutting the formation. The ore is generally free milling, consisting of white vitreous quartz, streaked with oxide of iron, the latter being generally the matrix of the rather coarse gold, and also of a porous-talcose quartz, containing flour gold. In some of the veins the gold is contained in a high grade mispickel, and, in ordinary pyrite, from the very start, but is easily freed in the shape of bright flour gold by roasting. In the country rock there are bands of green talcose slate, rich in gold. No opinion can be given as to the permanency of the veins in depth, and capital is essential to properly develop them. Meanwhile, three hundred stamps are crushing surface ores, paying from $12 to $30 per ton. The number of stamps will be doubled in less than a month, but none of the machinery is fitted for treating the base ores. The writer hopes, by the above account, to assist in dispelling the too prevalent idea that the Black Hills will be exhausted when its placer mines are worked out. J. H. S.

COMPOUND LOCOMOTIVES.*

Translated for the ENGINEERING AND MINING JOURNAL by Chief Engineer ISHERWOOD, United States Navy.

These compound locomotives use the same steam in two successive cylinders, and, though the system is common with stationary and marine engines, this is the first instance of their employment on railroads, notwithstanding the great convenience of its application in this case. In fact, while rendering, as in other engines, the physical conditions more favorable under which the steam expands, the compound system has the advantage in locomotives of enabling measures of expansion, proportional to the increasing pressures now used, to be obtained by the sole means employed with them for that purpose, namely, the simple lap valve and the Stephenson link, or equivalent apparatus. In introducing this system, it was indispensable that the character of the locomotive, for simplicity, should be preserved, and, consequently, that all arrangements should be avoided which sensibly complicated either its design or operation.

The following is a brief description of the new engines: The compound locomotive has but two cylinders; they are placed on the outside, and act at right angles to each other, as in ordinary locomotives with outside cylinders, the only difference being that the cylinders have different diameters, and that the smaller one alone, in the regular working of the engine, receives the boiler steam directly, discharging it after a first expansion into the larger one, which in turn discharges it into the chimney.

When the engine is to be started, the boiler steam, by means of a special apparatus, which constitutes the sole addition to the ordinary locomotive, and which from its design and purpose is called the *undoing* valve, is delivered directly into both the large and small cylinders, and the latter, instead of discharging it into the former, discharges it into the chimney, the engine in this case acting like an ordinary locomotive. This independent action of the steam in the two cylinders can also be employed when the engine has to overcome a momentarily greater resistance, like a short steep ascent, for instance.

The system just described has been for the first time applied by Mr. A. Mallet to three locomotives, constructed at Creuzot, for the branch railroad from Bayonne to Biarritz. They weigh, in service, from 19 to 20 tons each, and have cylinders of 9 7-16ths and 15¾ inches diameter, with pistons of 17¾ inch stroke. They have four coupled wheels of 47¼ inches diameter. The boiler has 484·4 square feet of heating surface, and is worked with a pressure of 142 pounds per square inch above the atmosphere.

The railroad from Bayonne to Biarritz is five miles long, and has grades of 15 in 1,000 for a length of two miles. The business done is very large, requiring at this time not less than fifty-eight trains per day.

The distance run by these locomotives, since they were put in operation, is about 25,000 miles, so that the practical results are well established. They work perfectly, and are no more difficult to handle than ordinary engines. They are very steady, even at the high speed of 25 miles per hour, for engines with wheels of 47¼ inches diameter. The chimney draft, notwithstanding the lessening of the number of exhaustions to one half, is ample for the boiler, which, though of reduced dimensions, easily furnishes enough steam. As to the consumption of coal, it is sufficient to say that the total weight consumed per mile, during the period of the heaviest loads, commencing on the 22d of July, is 14·2 pounds of Cardiff coal, including the quantity burned for raising steam and when stopping, etc., and that for trains whose ordinary weight is from 40 to 45 tons, exclusive of the engine, rising frequently to 50, 60, and even 70 tons on days of great travel over the above-mentioned grade. During a preceding period, in which the trains were lighter, the total weight of coal consumed was 13·3 pounds per mile. These figures show a considerable economy comparably with the ordinary system.

COMPRESSIBILITY OF LIQUIDS.—E. A. Amagat has conducted a series of investigations on the compressibility of volatile liquids, when the liquid state was maintained by pressure, at a temperature higher than their boiling point. The experiments were carried to a pressure as great as 39 atmospheres, the results being in the most satisfactory accordance with deductions from the mechanical theory of heat.—*Comptes Rendus.*

KRAFF AND SAUVE'S METHOD OF STEELMAKING.—By this method Bessemer, Martin, or other metals, which may be regarded as compounds intermediate between the pig-iron, iron, and steel, are transformed into fine steel. These substances acquire all the properties of the latter metal by being kept for some hours at a red heat, in a bed of carbon, over which a current of nitrogen, carbonic oxide, and various hydrocarbons passes slowly. Wood charcoal, turf, coke, or other fuel, thoroughly dried and heated to 50° C., are then immersed in a hydrocarbon, and alternate layers are formed of fuel and bars of metal. The whole is inclosed in a crucible-shaped pot, and heated to a red heat, the excess of oxygen is transformed into carbonic oxide, and the nitrogen into ammonia, so that the metals are placed in the gaseous medium recognized as the fittest for their conversion into fine or cemented steel.

* Note by Mr. A. Mallet, presented to the French Academy of Sciences by Mr. Tresca, and printed in the *Comptes Rendus* of September 10, 1877.

THE VALLEY OF THE COLORADO RIVER, AND ITS GEOLOGY.—XII.*

The most elevated portion of the country is a central belt, about twenty-five or thirty miles in width, and about eighty miles in length. This is called, by the Indians, *Kaibab*, or "mountain lying down," and we have adopted the name. It is well defined on the east and west by lines of cliffs and steep slopes, which have been formed by displacements, and on the south by the chasm of the Colorado, but on the north it abuts against the Vermilion Cliffs. The lines of cliffs which form its eastern and western boundaries extend to the south beyond the Grand Cañon, for the faults run far to the south, and they define there, in part, a companion, or twin platform. Had there been no river running, there there would have been but one plateau.

From this central belt the general surface of the country drops by steps to the east and west, and the edge of each step marks the line of a fault, or its equivalent fold.

In the region under discussion there are six of these great displacements, which give rise to important elements in the topography, and deserve special mention. I shall enumerate them in order, from east to west, omitting mention of the faults and folds of minor importance.

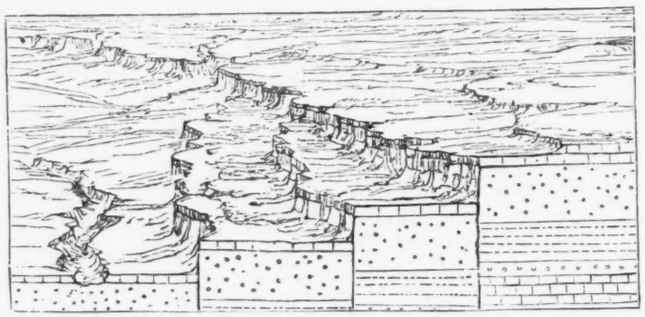


FIG. 31.—SECTION ACROSS A BRANCHING FAULT.

East of Marble Cañon, and running in a general northerly and southerly course, so as to cross the Colorado at the mouth of the Paria, we have the Paria Fold, in which the down-fall of the rocky foundation is to the east of the axis of the flexure. Where it crosses the river the throw is about one thousand and eight feet, but it increases toward the south.

Going west across Marble Cañon to the foot of the Kaibab Plateau, we find another great fold. Tracing it from the northern extremity of the plateau to the south, we find that, nearly half way along, it branches so as to form two monoclinal folds. These separate rapidly until they are about four miles apart, and then run parallel to each other for twenty-five or thirty miles, when they change into faults. The throw of the displacement is about three thousand feet, and is, approximately, the same whether it appears as one fold, as two folds, or two faults. We have called these the Eastern Kaibab Faults. The down-fall of the beds, as in the Paria Fold, is to the east of the axis of flexure.

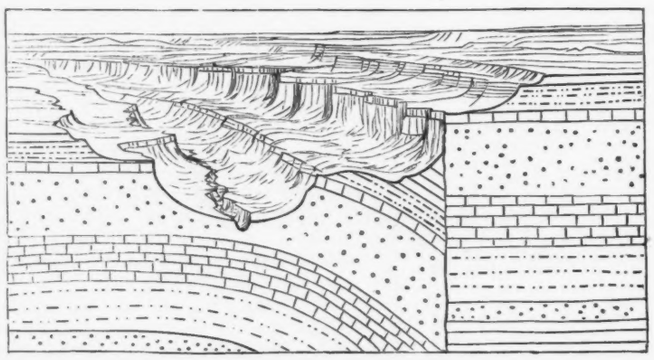


FIG. 32.—FAULT WITH THROWN BEDS FLEXED DOWNWARD.

Crossing the Kaibab Plateau, we come to another great monoclinal fold, which changes into a fault in some places, and these faults sometimes branch. The throw is here on the western side of the axis of flexure, and varies from five hundred to two thousand feet. We call this the Western Kaibab Fault.

Continuing to the west, and passing over some minor faults, we reach at last the To-ro-weap Valley. On the eastern side of this valley there is an abrupt wall, eight hundred or nine hundred feet, which marks another fault, the throw of which is also to the west. This is the To-ro-weap Fault. Its throw is but little over eight hundred feet where it crosses the Grand Cañon. Farther to the south it increases somewhat, but to the north it becomes less, and where it crosses the Vermilion Cliffs it is only about two hundred feet.

Twelve or fifteen miles to the west is the Hurricane Ledge Fault. Its throw is also to the west. It has been traced from a point north of Tokerville southward across the Grand Cañon, and out to the brink of the great San Francisco Plateau. The throw varies from two to three thousand feet. Usually it is a sharp, or abrupt, fault, though here and there the strata have been caught below.

Twenty-five or thirty miles farther to the west, we find the Grand Wash Fault—a fault in some places, elsewhere a fold. Here, also, the throw is to the west, and it is more than five thousand feet where it crosses the Colorado.

So we have selected, for purpose of discussion here, six great displacements—the Paria Fold, the Eastern Kaibab Fault, the Western Kaibab Fault, the To-ro-weap Fault, the Hurricane Ledge Fault, and the Grand Wash Fault. Let us review them in reverse order, and examine the lines of cliffs to which they give rise, and the table lands which they divide. (See bird's-eye view Fig. 7.)

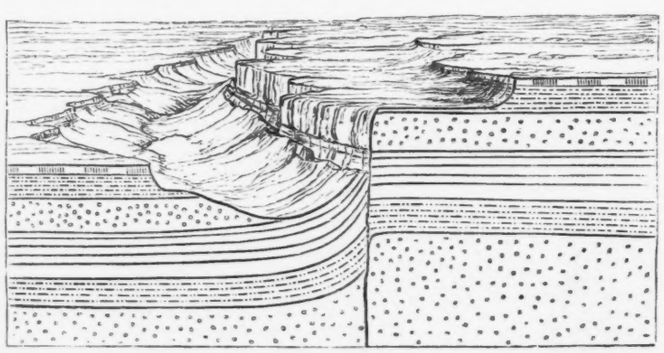


FIG. 33.—FAULT WITH THROWN BEDS FLEXED UPWARD, A DRAGGED FAULT.

We will start at the Grand Wash, half a dozen miles north of the river. Here the summit of the Carboniferous rocks is deeply buried beneath sandstones and shales of later origin. At the start we are but five or six hundred feet above the level of the Colorado, and we climb by a gentle slope several miles in length, until we reach an altitude of six or eight hundred feet above the starting point, and are at the foot of the Grand Wash Cliffs. Now we must climb this great wall, one thousand five hundred or one thousand eight hundred feet high; no easy task, as it is not a mountain slope up which we can walk, but a wall, broken somewhat with gulches, and set with narrow benches or shelves, here and there, and up some one of these gulches and along the narrow shelves we pass, until we reach the summit of the first great terrace.

Still we go a short distance to the east, and must climb another thousand feet or more, and we are on the Shi-wits Plateau. This last escarpment of a thousand feet is not due to a fault, but is a line of cliffs formed by erosion. On the plateau there is a dead volcano, and from its crater have poured floods of basalt in great sheets, which now stand as a central and higher table on the plateau.

We go on to the east thirty miles. It is not an easy way, but we stop not here to describe it, and we arrive at the foot of the Hurricane Ledge. We have descended a little, for the Shi-wits Plateau inclines, or dips, from its western margin to the foot of this ledge, or line of cliffs. The Hurricane Ledge is more than two thousand feet high, and we have another hard climb.

It is related that a storm overtook a party of Mormon officials while attempting to explore a route for a wagon road up a gulch which comes down from the upper country, and hence its name, Hurricane Ledge.

It presents a bold, precipitous wall to the west, which forms, along its entire course, an impassable barrier to the traveler, except that here and there it is cut by narrow cañons or gulches, which may be ascended, and in two or three places volcanoes, standing on the plateau above, have poured out streams of lava, that have run over this wall in rugged slopes, which can be climbed with difficulty.

Then we pass on to the east, winding among volcanic cones, and in many places walking over sheets of cooled basalt and beds of cinders, until we reach the foot of the To-ro-weap Cliffs. Here we have another wall eight hundred feet high to climb.

Still passing to the east, by a difficult way, crossing cañons and gulches, at last we reach the western foot of the Kaibab Plateau, and again climb two thousand feet to its summit, where we are eight thousand feet above the level of the sea. To the south we can see the Grand Cañon of the Colorado; its meandering course can be traced for two hundred miles; far away to the north we see the ragged lines of Vermilion Cliffs, an escarpment due to erosion.

* Extracts from Report of Major J. W. Powell on *The Exploration of the Colorado River of the West*. Washington, 1875.

THE SILVER CAVES OF PERU.—Mr. Henry Sewell, in the London *Mining Journal*, thus describes these curious deposits: "The mineral caves of Huallanca are situated at 14,700 feet above the level of the sea. The inspection of these mines was a very trying affair, the rarification of the air causing an extraordinary increase in the pulsation of the heart, and making it dangerous to move about except with great care. These silver mines are situated in the heart of a coal formation which has been upheaved by the outburst of porphyry, forming immense backbones. The stratification is standing on its beam ends, and almost perpendicular. The class is a new tetrahedrite, containing about 800 oz. to the ton, and about 150 yards to the left is the first coal seam from where the smith orders his coals to be extracted. The ores containing 100 to 130 oz. to the ton are thrown over the dumps, their carriage to the coast being too expensive. I recommended the owners to collect all these poorer ores and to smelt them in a reverberatory furnace into regulus, thus raising them about 600 oz. to the ton. The ore is found in the shaly portion of the formation as well as in the sandstone. In the latter it is found in a most singular condition—in huge "vugs" or caves, many of these being as much as 25 feet to 30 feet long, and about an equal size in depth. These caves are coated with from 2 inches to 3 inches of argentiferous ores, and millions of crystals of tetrahedrite are destroyed by the picks of the miners, who break down the ore in that manner. Some of these caves have produced as much as £30,000 in a single day. The way they are discovered by the native miners is also singular. They follow for months a thin little cleavage of about ⅛ of an inch. This contains chalcedony, and they drive horizontally and at an incline of 45°, in order not to miss them. They vary in size from a few feet to the above."

ELECTRIC LIGHT FOR CITIES.—The municipal council of Exeter is the first public body in England which has officially recognized the value of the recent experiments in electric lighting. It has postponed a contemplated purchase of gas-works, under a hope that electricity will soon be shown to be more satisfactory as well as more economical. The three rival systems, of the Gramme machine, the Alliance machine, and the electric candles of Jablochkoff and Denayrouze, are continuing their experiments in Paris on a large scale.—*Nature; Les Mondes.*

AMERICAN INSTITUTE FAIR.

The forty-sixth annual exhibition of the American Institute is now open at the Hall of the Institute, Third Avenue and Sixty-third Street, New York. In some respects this exhibition promises to be one of the most successful yet held. This is owing to the stimulus given exhibitions in general by the Centennial of last year, and the fact that manufacturers have on hand a number of expensive exhibits prepared for the Centennial, many of which we now find here. The main building, where are assembled the various manufactures of the country, is particularly brilliant with its numberless show cases and structures, in all their splendor of gold and silver tinsel.

The total absence of a mineralogical display is to be regretted. There is the usual fine display of steam engines, boilers, steam pumps, rock breakers, etc., which are worthy of attention of engineers and of purchasers.

The main shafting is driven by a 50 horse-power horizontal engine, of the modern cut-off type. The steam furnished it is generated in boilers owned by the Institute, and are of English make.

The first machine that would attract the attention of our readers is the "old reliable Blake rock breaker" (manufactured by the Blake Crusher Company, New Haven, Conn.), which is exhibited in several sizes, and is shown practically at work.

Messrs. Blake also show a prospecting or laboratory crusher, which can be readily worked by hand, and which is invaluable for use in new mining districts, or in distant localities difficult of access, and where the actual analysis of the ore product is not sufficiently known to warrant the erection of a large machine.

The Sullivan Machine Company, Claremont, N. H., exhibits a very simple and efficient turbine water wheel, which miners would do well to note.

Messrs. O'Neill & Company, of No. 9 Warren Street, New York, exhibit a new hand punch and shears, which will punch three-quarter inch holes in three-quarter iron with ease and rapidity, by means of an ingenious system of leverages.

A fine display of emery wheels is made by the Union Stone Company, of Boston.

The Abendroth & Root Manufacturing Company, of Brooklyn, New York, exhibit sections of spiral piping, in various diameters. It is designed for use in mines and manufactures, and has much merit. These pipes have been already noticed in these columns.

The Baker pressure blower, for ventilation in mines and for blast purposes, is shown by the company in several sizes.

Chas. B. Hardick, Brooklyn, New York, has a fine display of their well known and popular "Niagara" direct acting steam pumps. This pump is too well known to our miners all over the country, to need any extended remark here. Mr. Hardick has lately introduced a deep well pump, constructed on the same general principle as the "Niagara," which is meeting with great success.

Foster & Jamieson, also of Brooklyn, exhibit steam pumps, rotary pumps, and deep well pumps, which have of late become very popular with the public.

William E. Kelly, of New Brunswick, N. J., shows a fine specimen of his direct acting plunger pump, several of which have been placed in near-by mines; they are specially adapted for pumping gritty or sandy water, also oil and heavy fluids. Illustrations of these new and ingenious pumps recently appeared in these columns.

There is quite a good display of caloric engines, the Brown Caloric Engine Company, New York, having the largest show. There is also the Roper caloric engine exhibited. These engines, operated by hot air, are very simple in construction, and have but few working parts. They are mostly employed in light manufacturing and for pumping purposes.

T. F. Rowland, Brooklyn, N. Y., exhibits samples of the Duc spherical elevator bucket, neatly arranged in frames. They are designed for use in endless belts for elevating coal ore, clay, flour, grain, etc. They are claimed to be a great improvement on the square bucket, not having any corners to catch. They are made in sizes from 3½ to 16 inches, on the belt.

We regret the absence at this notable exhibition of a great many machines, useful in mining operations, which are manufactured in or near Near York, and might, with little expense, be exhibited with much profit. We are told by the management that over 300,000 persons visit these expositions annually, and that most exhibitors find it to their advantage to be represented at them. Since last year, the hall of the Institute has been painted and renovated, and a substantial cement flooring has been placed over the whole area of the building, supplanting the former board floor, which, with its saturations of oil, etc., was considered dangerous.

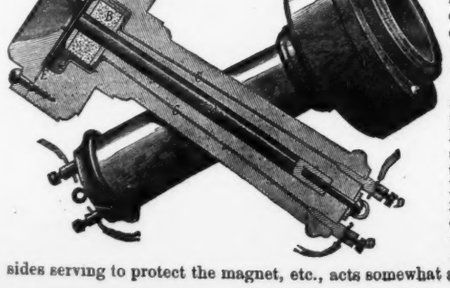
Upon the whole, we think the exhibition, under the general superintendence of Chas. Magee Hall, Esq., is extremely creditable, and will, no doubt, prove profitable. W.

THE BELL TELEPHONE.

Professor A. Graham Bell's telephone has of late been simplified in construction. It consists now of but three metal portions contained in a casing of wood or light hard rubber, but five and five-eighths inches in length and two and seven-eighths inches in diameter at the enlarged end. This telephone differs from all others, as it involves the use of no battery.

The simplicity of the construction is clearly shown in the annexed engraving. Referring to the sectional view, A is a permanent magnet, held by the screw shown in the rear. Around one end of this magnet is wound a coil, B, of about 60 feet of No. 38 insulated copper wire (silk covered), the ends of which are attached to the larger wires, C, which extend to the rear and terminate in the binding screws, D. In front of the pole and coil, B, is a very thin disk of soft iron, E. Finally the whole is inclosed in a wooden casing having an aperture in front of the disk, and which, besides serving to protect the magnet, etc., acts somewhat as a resonator.

Fig. 1.



The principle of the apparatus is as follows: The influence of the magnet induces all around it a magnetic field, and the iron diaphragm, E, is attracted towards the pole. Any alteration in the normal position of the diaphragm produces an alteration in the magnetic current, by strengthening or weakening it, and any such alteration of the magnetic field causes the induction of a current of electricity in the coil, B. The varying strength of this induced current is dependent upon the rapidity of the vibration of the disk, and this depends upon the air disturbance made by the voice in speaking. Therefore, first, a wave of air throws the diaphragm into vibration; second, each movement produces a change in the magnetic field; and third, an induced current is generated in the coil wire. Now, if to the binding screws wires be attached, communicating in like manner with an apparatus similar to that described, an induced current will pass through the second telephone, thereby modifying the strength of its magnet, thus increasing or diminishing its attraction for the diaphragm. Hence every vibration made by the first disk is repeated by the second, and whatever sound produces the vibration of one is transmitted to and reproduced by the other. By placing the second instrument to the ear, the voice is heard in every intonation and quality, so that one is able to recognize the speaker by his voice. The number of instruments in the circuit seems to make very little difference in their action, so that any number of stations may be put upon one line in a mile. The extreme distance through which this telephone can be used has not yet been determined, but it has been successful over a distance of thirty two miles, and with well insulated wire could probably be used over several hundred miles.

It is so extremely sensitive that, if the wires are carried on the same pole and in close proximity to other wires, other currents are induced, for example, the tick of the ordinary Morse instrument can be heard, and these currents produce confusion.

The patent for the Bell telephone is now owned by the Telephone Company of New York, which is now leasing the right to use them. In the city, where the company keeps the instruments in order, the annual rental is $50; this, of course, does not include the wire. We hope, before long, to see the telephone generally introduced in our mines. It will prove of great service, and, no doubt, will be the means of preventing many serious accidents.

LECTURES ON MINING.—No. LII.

By Prof. W. W. Smyth, M. A., F. R. S., Royal School of Mines, London.

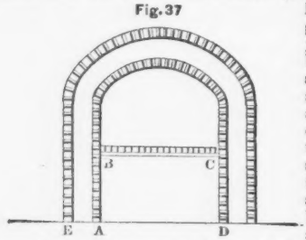
VENTILATION.

There is one method of aiding natural ventilation by dividing the level which is common in metalliferous mines—the putting in of an "air sollar." The lower part of the level, in fact, is partitioned off by a floor; timbers being first laid across, after the manner of forming a regular roadway, then those covered by close fitting planks, and finally the whole made air tight by means of clay, or some such material. The air will then pass along this air sollar in one direction in the end, and in the reverse direction in the upper part of the level. In the thick coal of the Staffordshire district an "air-head" is driven—that is to say a small drift, generally not more than 2½ to 3 ft. by 3 or 4 ft., and small communicating passages cut through into the level, as is done when there are two parallel levels. In some cases this head is driven by the side of the level, but it is better, as proposed many years ago by Mr. Ryan, that it should be driven in the top of the seam, since in that case when you come to work the total height of the coal you can drain off into this top head the specifically lighter gases, including, therefore, the fire-damp; whereas, with the head at the side the fire-damp is apt to accumulate along the top of the level. Mr. Ryan seemed to think his plan applicable in all cases, but there are very many cases in which it is quite impracticable. Mr. N. Wood's experiments showed what large volumes of air could be drawn through a mine by natural ventilation. In the great Hetton Colliery, under his management, 220,000 cubic feet of air per minute were passed, of which it was calculated that 100,000 feet were due to natural ventilation. In another instance, where the temperature at the bank was 43°, and the air in the downcast 45°, the return was 63°, so that there was a difference of 18°, which was found sufficient to give a circulation of 36,500 cubic feet per minute. There may, however, be many cases in which during the winter, when there is a great contrast between the temperature of the external air and that in the mine, there may be a great impelling force; at another season the temperature may be so much more equal that the current is checked, or stopped; and then it will be necessary either to apply artificial means or to stop the working for a time. There is another consideration still; if one district of a colliery is safe enough to be worked with naked lights, while another part is fiery and requires safety-lamps, as long as the current of air passes the naked lights first, then goes along the fiery district and directly into the upcast, all may be well. But if, owing to any cause, the ventilation be checked or reversed, then the fiery air will come in contact with the naked lights, and serious consequences very probably follow. In such a case it becomes absolutely necessary to provide artificial means for maintaining the current always in the proper direction. If the space from which the foul air is to be removed is very small, as, for example, a small side working, the men will very frequently "dust it out," occasionally with a cloth, or even with their jackets, agitate and thus mix and renew the air therein, and this may suffice if there be a good current passing close by.

With regard to the means for promoting artificial ventilation, we may first look to the method so very commonly employed in the collieries—the use of a furnace for the purpose of giving sufficient lightness to one column of air. The most simple way of doing this is what may be frequently seen in the midland districts—letting down a frame filled with burning coals into the upcast shaft. As this is usually lowered to only a small distance down the shaft, it follows that only a portion of the air is heated—that from the fire to the surface. A modification of this sometimes used is to connect the top of the upcast with a closed building (to which access is obtained by means of a double door, after the manner of a lock), in which is a fireplace connected with a stack. There are two objections to this latter method—that if the stack be small you wiredraw the current, and cannot expect to obtain so large a circulation as if the stack was of about the same diameter as the shaft. The second point is that the amount of heated air, measured by the height of the column, is comparatively a mere trifle compared with the depth of the shaft that it has to serve. This compares very unfavorably with the method of placing the furnace at the bottom of the shaft, where you have a large column of heated air, contrasting very powerfully with the weight of the column of cool air in the other shaft. Therefore, in most collieries where a brisk circulation is needed, they have seen the necessity for placing the fire at the bottom. You may see these fireplaces of all sizes, from that of an ordinary grate to a kitchen range, and some others of very large size. Take the case of a pit of not very large size in North Staffordshire, we

shall find the furnace constructed (Fig. 37) of a straight wall (A B, C D) 3 ft. high, then the firebars supported on a girder of iron, and above that an arch 3 ft. high, the breadth of the whole (A D) being 6 ft. This is inclosed in firebrick, and when special care is taken a second arch is built, leaving between the two an air space, through which the air may circulate, so as to prevent any danger of setting fire to the adjoining coals. Some serious accidents have occurred from the firing of the coal by the furnace, and great attention has been drawn to the matter. It is desirable to isolate the furnace as far as possible from the coal, and even from any dark carbonaceous shales which occur with the coal. In the large Clay Cross pits the furnace has a width of 9 ft. from wall to wall, the girder is put in at a height of 4 ft. 6 in., and there is a height of 5 ft. above the bars. As a rule 3 ft. beneath the bars appears to be sufficient. A fire of this kind well kept up is, perhaps, one of the most satisfactorily burning fires as regards the full consumption of the coal. In some cases, where the air comes in below the bars, the whole may be seen in a magnificent blaze, with not a particle of smoke coming away from it. To obtain a greater velocity through the furnace the upper portion of the arches may be bricked up, or it may be better to have a sheet of iron moving on slides in front, which can be slid up and down, and may be used to regulate the draught according to circumstances. If you have a large area to deal with you may either have several shafts, each with its own furnace, or you may have several furnaces playing into one shaft, as, for example, in Hetton Colliery three furnaces into a shaft 15 ft. diameter. The simplest plan of conveying the air to the furnace will be that of letting the return current pass directly along the drift through the furnace, part going over the fire, and part, perhaps, between the arches or through side passages, and so into the shaft; or part of the air may be led by a pipe which opens under the bars. But if the return air is foul, or likely to be suddenly fouled by blowers, then obviously you must not bring it into close proximity with this open flame. In such a case the return current will have to be divided, only a safe portion being led to feed the furnace, the rest being carried by what is called a "dumb drift" into the shaft, at a distance of at least 30 or 40 yards above the furnace, so as to be out of reach of sparks and flame. With a good ventilating furnace an average temperature of 150° to 160° Fahr., can be obtained in the upcast. Sir Goldsworthy Gurney, many years ago, in his endeavors to supersede the ventilating furnaces by his project of a steam-jet, raised several objections to the action of a furnace. For example, there was what he called the invisible brattice, and this can be observed in an ordinary kitchen fire, where if the chimney be too large, or the fire not properly proportioned to it, there will be a tendency for the air to steal down the sides, and thus to check the heating of the shaft. Then he made a great deal of the furnace paradox, that you cannot readily get more than a certain effect out of a given furnace. Within certain limits there is a good deal in this argument; for instance, if you have a certain area of fire-bars burning a certain quantity of coal, beyond a certain point doubling the fuel will not give you double the effect; you will require considerably more than double the amount of coal to give you a double effect. But this can be very readily overcome, as by putting in a second furnace, or by having a larger area; or you may have a large compound furnace, as the one at Hetton Colliery, 26 ft. long. This furnace, introduced by Mr. Daglish, has a door at one extremity, which can be opened partially or fully, or closed entirely, according to the requirements of the feed; the air may be supplied by any of the methods mentioned above. At the side of the furnace are a number of doors at which the men will usually be occupied. The advantage of this great length of fire-bars is this, that under ordinary circumstances you may require only a moderate amount to be covered with fire, but if dangerous weather comes on, if the barometer and thermometer indicate the approach of weather in which the evolution of the gas is more liable, or if on examining the works you find a quantity of gas present, you give orders at once for the fire to be increased, and this can be done to a very great extent by using more of the space afforded by the bars. And, again, with a small furnace, whenever it is necessary to clean it out the ventilation will necessarily be considerably checked, whereas with a long furnace you have only to rake the fire to another part while the first is being cleaned. The advantages connected with these large compound furnaces have caused several to be erected of late years; thus there is one in the Monkwearmouth Colliery 12 ft. square, and another large one has been erected in the mine in North Wales belonging to the British Iron Company. This latter has a width of 10 ft., the girder has a height of 1 ft., with 3 ft. below and 6 ft. above it, making the total height of the arch 10 ft. Besides the arch over the bars there is a small arch on each side, which runs round the furnace to the shaft, and then over the whole is a large arch of nearly 27 ft. across. The length of the bars is 16 ft., divided into four sets. The furnace is intended to be fed from each extremity, and in this case, as it ought to be in many cases, the furnace is fed with fresh air, "scale" of air equal to 30,000 ft. per minute being provided for the purpose. By the combustion of a suitable quantity of coal in this furnace a circulation equal to 220,000 cubic feet is obtained.

Fig. 37



Sir Goldsworthy Gurney, besides stating these objections to the common furnace, proposed that it should be superseded by the use of a steam jet, and he persuaded some gentlemen of both Houses of Parliament that this change would be so advantageous that it was endeavored to make it compulsory to abandon the furnace and introduce the steam jet. In the northern districts, however, many careful experiments were made, which resulted in showing that the steam-jet could not be employed except under peculiar circumstances, and with the combustion of an enormous quantity of fuel. There is no doubt that by a properly constructed furnace you get larger volumes of ventilating air than by any other method whatever. A pipe was carried and turned down the shaft, ending in a jet of ¼ in. to ⅛ in. diameter, and steam of high pressure was supplied, this tending to force the air down the shaft; at the other shaft a pipe was carried to the bottom, and the jet turned upwards, the steam thus tending to carry up the air with it, the jets acting as it were the part of pistons. A number of jets were employed instead of one where a greater effect was desired. In the experiments carried on in the North (which the lecturer had seen himself) showed that the quantity of air which could be got to pass into the upcast by any variation of the steam jet was very far surpassed by a furnace after it had been lighted for one hour only. Moreover, with the steam jet, two or three men at the fires could not fire fast enough, whereas one man, who is perhaps unfit for laborious work in other parts of the mines, may suffice to attend to the ventilating furnace.

Among other methods of ventilation we may look first at the system of falling water. The drops of water falling down a shaft have a more or less mechanical action in forcing the air down, and this principle may, under certain circumstances, come into play most advantageously. For example, in the case of an accident or explosion, or under other circumstances, when you cannot get down to light the furnace, the pumps may be allowed to run over, and the water to fall down the shaft, and by that means a good deal of air may be got down into the mine. But this method (the lecturer thought) has never been satisfactorily shown to be capable of throwing down a sufficient quantity of air for ventilation, and probably there are very few cases in which it would be desirable to adopt it. There are two or three methods of using waterfalls for forcing air (besides the employment of it to work a fan) which have met with great application. One of these is the *trompe* of the Pyrenees. The principle is briefly this—a stream of water falls through a vertical wooden pipe, in the sides of which are a number of oblique holes through which the air is drawn in by the falling water. The water falls into a barrel or box below, in which is placed a large stone or iron sheet to break up the column; there is an exit for the water in the lower part, and the level of the water is always kept above this. In the upper part the air collects and can be led off by a pipe from the top to the place where it is required. Another method is that of having a pipe laid to the bottom of the shaft, a conical piece pointing in the direction of the level there where the air is to be conducted; a jet of water then playing into this conical piece (collected in an overflow vessel beyond) will carry the air through with it, and the air will pass forward into the level. This has been adopted at some of the Cornish mines, but it is not a method which can be used on a large scale.—*London Mining Journal.*

CLASSIFICATION OF COALS.*

By Prof. Persifor Frazer, Jr., Philadelphia.

(*Continued from page 277.*)

TABLE XII.—PITTSBURG BED, UPPER BENCH, WASHINGTON COUNTY, PA.

	28 N. Eagle Works.	29 Liddel's.	30 Thomas's.	31 Bushfield's.	32 L. Vernon's.
Fixed Carbon	58·154	55·030	50·311	54·561	54·185
Volatile Hydrocarbons	35·830	35·075	40·350	37·735	38·580
Water	1·180	0·650	1·080	1·730	0·850
Sulphur	0·761	1·910	2·594	1·499	1·290
Ash	4·075	7·335	5·665	4·475	5·095
Sum	100·000	100·000	100·000	100·000	100·000
Coke	62·990	64·275	58·570	60·535	60·570
Color of Ash	Gray.	Cream.	Red.	Gray.	Gray-red tinge.
Simplified: Fixed Carbon	58·154	55·030	50·311	54·561	54·185
Simplified: Volatile Hydrocarbons	35·830	35·075	40·350	37·735	38·580
Simplified: Impurities	6·016	9·895	9·339	7·704	7·235
Fixed Carbon *	62·09	61·07	55·49	59·11	58·41
Volatile Hydrocarbons	37·91	38·93	44·51	40·89	41·59
C / V. H-C.	1·64	1·57	1·24	1·20	1·40

† Fixed carbon plus volatile combustible matter taken = 100. Other constituents of the coal neglected.

TABLE XIII.—PITTSBURG BED, LOWER BENCH, WASHINNTON CO., PA.

	33 Neil's.	34 J. White's.	35 J. Magee's.	36 N. Eagle Works.	37 Liddel's.
Fixed Carbon	60·414	37·979	40·253	58·167	56·829
Volatile Hydrocarbons	34·655	34·125	38·720	35·275	36·880
Water	1·120	1·290	1·130	1·140	1·425
Sulphur	0·766	0·586	3·722	0·785	0·790
Ash	3·045	6·020	16·175	4·660	4·070
Sum	100·000	100·000	100·020	100·000	100·000
Coke	64·225	64·585	60·150	63·585	61·695
Color of Ash	Gray.	Cream.	Red.	Gray.	Gray-red tinge.
Simplified: Fixed Carbon	60·414	57·979	40·253	58·167	56·829
Simplified: Volatile Hydrocarbons	34·655	34·125	38·720	35·275	36·880
Simplified: Impurities	4·931	7·896	21·027	6·558	6·291
Sum	100·000	100·000	100·000	100·000	100·000
Fixed Carbon *	63·54	62·94	50·97	52·24	60·64
Volatile Hydrocarbons	36·46	37·06	49·03	37·86	39·36
C / V. H-C.	1·74	1·69	1·04	1·65	1·54

TABLE XIV.—PITTSBURG BED, MAIN BENCH GREENE, CO., PA.

	38 Maple Farm.	39 L. Vernon	40 P. Ashwist's
Fixed Carbon	50·051	55·608	48·769
Volatile Hydrocarbons	36·490	37·225	40·995
Water	1·030	1·040	1·010
Sulphur	0·819	0·982	1·206
Ash	2·610	4·145	7·020
Sum	100·000	100·000	100·000
Coke	62·480	61·735	57·995
Color of Ash	Cream.	Cream.	Red.
Simplified: Fixed Carbon	59·051	56·608	48·763
Simplified: Volatile Hydrocarbons	36·490	37·225	40·995
Simplified: Impurities	4·459	6·167	10·236
Sum	100·000	100·000	100·000
Fixed Carbon *	61·80	60·33	54·33
Volatile Hydrocarbons	38·20	39·67	45·67
Sum	100·00	100·00	100·00
C / V. H-C.	1·61	1·52	1·19

* A paper read before the American Institute of Mining Engineers, at the Wilkes-Barre meeting, May, 1877.

* Fixed carbon + volatile hydrocarbons = 100.

TABLE XV.—PITTSBURG BED, BENCH NOT STATED.

	41 Greene Co.	42	43 Washington County.	44	45
	Dr. Mullin's Low'rB'nch	Harding's Shaft.	T. Thompson's Bank.	Th's Radd's Bank.	Frick & Co. Average.
Fixed Carbon	52·649	57·063	55·033	55·920	59·616
Volatile Hydrocarbons	38·390	37·825	39·790	38·525	30.107
Water	0·900	1·540	1·095	0·6 0	1·260
Sulphur	1·941	0·762	1·172	0·855	0·784
Ash	6·120	2·810	2·910	4·020	8·233
Sum	100·000	100·000	100·000	100·000	100·000
Coke	60·710	60·635	59·115	60·795	68·633
Color of Ash	Reddish-gray.	Cream.	Gray.	Red.	Reddish-gray.
Simplified: Fixed Carbon	52·649	57·063	55·033	55·920	59·616
Simplified: Volatile Hydrocarbons	38·390	37·825	39·790	38·525	30·107
Simplified: Impurities	8·961	5·112	6·442	5·555	10·277
Sum	100·000	100·000	100·000	100·000	100·000
Fixed Carbon *	57·83	60·14	58·82	59·21	66·44
Volatile Hydrocarbons	42·17	39·86	41·18	40·79	33·56
Sum	100·00	100·00	100·00	100·00	100·00
C / V. H-C.	1·37	1 50	1·42	1.45	1·98

TABLE XVI.—PITTSBURG BED IN SOMERSET COUNTY, PA.

	46 Saylor's Hill Mine.	47 Cumberland and Elk Lick Co. Mine.	48 KeystoneCoal Mining Co.	49 Livingood & Keim.
Fixed Carbon	66·510	69·352	70·231	68·774
Volatile Hydrocarbons	19·965	21·470	19·610	22·350
Water	1·630	1·385	1·058	1·665
Sulphur	0·775	0·763	0·761	1·246
Ash	11·120	7·030	8·340	5·965
Sum	100·000	100·000	100·000	100·000
Coke	78·405	77·145	79·340	75·985
Color of Ash	Gray-red tinge.	Gray-reddish.	Gray.	Gray-pink tinge.
Simplified: Fixed Carbon	66·510	69·352	70·231	68·774
Simplified: Volatile Hydrocarbons	19·965	21·470	19·610	22·350
Simplified: Impurities	13·525	8·178	10·159	8·876
Sum	100·000	100·000	100·000	100·000
Fixed Carbon *	76·91	76·36	79·73	75·47
Volatile Hydrocarbons	23·09	23·64	20·27	24·53
Sum	100·00	100·00	100·00	100·00
C / V. H-C.	3·33	3·23	3·93	3·07

TABLE XVII.—PITTSBURG BED IN SOMERSET CO., PA.

	50 E. Yoder's.	51 Wilhelm's Low.Bench.	52 Wilhelm's. The Rider.	53 J. Beechy's.
Fixed Carbon	69·677	66·907	69·986	69·016
Volatile Hydrocarbons	21·285	21·000	21·450	21·010
Water	1·465	1·190	1·570	1·680
Sulphur	0·693	0·713	06·79	0·764
Ash	6·880	10·190	6·315	7·530
Sum	100·000	100·000	100·000	100·000
Coke	77·250	77·810	76·980	77·310
Color of Ash	Reddish-gray.	Reddish-gray.	Reddish-gray.	Gray-red tinge.
Simplified: Fixed Carbon	69·677	66·907	69·986	69·016
Simplified: Volatile Hydrocarbons	21·285	21·000	21·450	21·010
Simplified: Impurities	9·038	12·093	8·564	9·974
Sum	100·000	100·000	100·000	100·000
Fixed Carbon *	76·60	76·11	76·54	76·64
Volatile Hydrocarbons	23·40	23·89	23·46	23·36
C / V. H-C.	3·27	3·10	3·26	3·28

TO BE CONTINUED.

THE UTAH MINING DISTRICTS.—IX.

(Special Correspondence from our Western Office.)

STOCKTON—DRY CANON—OPHIR.

These camps were pretty thoroughly described in the ENGINEERING AND MINING JOURNAL of July 21, so that I will mention them but briefly for fear of repetition. The engineer who surveyed the Utah Western Railroad from Lake Point on, ought to have a gold medal for stupidity. His main idea seems to have been to get an easy grade at all hazards, and he has succeeded so well that he has run the road to "no-where," plump into the face of a hill, where the only way out is to drive a two-mile tunnel into a lake on the other side. Instead of running up to Tooele, and thence by a very easy grade over the divide to Stockton, he has left Tooele (the only settlement at all between Lake Point and Stockton) three miles to the eastward, and gone along through the sage brush to the above-mentioned hill. He is probably a great admirer of the straight line, whereas the stockholders may ultimately look very crookedly at the expense account.

It is dull at Stockton, and the mines are doing very little. The same old trouble, depression in lead, is largely the cause.

The *Silver King No.* 1, *Silver King No.* 2, *Reno, First National, Legal Tender, Southport, Musquetine*, etc. etc., are not working.

The *Merwin, Pierson, War Eagle*, and *Great Basin* are working a small force each, the *Merwin* employing 9 men, and the others two each. The *Merwin* is down 110 feet, and looks quite promising, with a fair seam of ore all the way down and a goodly body at the bottom. The ore is a good quality of carbonate of lead and galena, carrying some 15 oz. silver, and running about 50 per cent. lead. The yield at present is 2 tons and upwards per day.

Timber hereabouts is pretty scarce. Stockton makes a very pleasant winter camp on account of its low altitude and freedom from snow and excessive cold.

Half a mile westward from town is located the Waterman Smelter. It was burned down in May last. but has been rebuilt in a most substantial manner, and will be in full blast shortly. Two stacks of 35 to 40 tons capacity each, a new dust and fume condensing apparatus of Mr. Wm. Ayres's (manager) own invention, two engines, two air fans, etc. etc., constitute the plant. The buildings are sided and roofed with tin instead of lumber, which renders them almost entirely fire-proof.

Two miles southwest of Stockton, at Rush Lake, is located the Chicago Smelter. If lead were at a respectable figure, these two smelting establishments would have all the ore they could attend to from the mines around Stockton, Dry Cañon, and Ophir.

Dry Cañon is the liveliest camp of the three at present, and even there they are not doing very much. Some of the best mines are having trouble with litigation, the *Queen of the Hills* being under injunction, etc.

The mines that are working to any mentionable extent are the *Herschel and Occident, Queen of the Hills, Mono, Deseret*, and *Hidden Treasure*. The two first are at loggerheads, and neither is doing much. The *Mono* is *the* famous mine of the camp, having yielded at times most wonderfully. A small force is being employed just now, putting the main incline shaft in good shape, with heavy timbers, etc., preparatory to deeper working.

The *Deseret* is working only 4 men, making air connections, etc., and debating whether or not to erect hoisting works this fall, in view of the depressed ore market.

The *Hidden Treasure* is doing the bulk of the ore producing at Dry Cañon this summer. The ore is of a most desirable quality, and occurs in large bodies. Thirty tons daily is the average output, with a force of 75 men. A tramway has lately been completed from the mine down to Jacob City, a distance of 1,200 feet, which greatly facilitates the shipping of the ore to the smelters. *Ophir* is very dull, there being but few men in the camp, and hardly a mine thereabouts worked to any extent whatever.

The *Buck Horn* is working some 6 men, and producing 40 to 50 tons monthly. The *Lily Rose* is also doing a little, working 4 men, and shipping from 20 to 25 tons monthly. Beyond these only prospecting and gophering is going on. Lyon Hill is very quiet.

The best mine of the district, so far as developed, is the *Miner's Delight*, and it has caved badly within a short time, so that it is dangerous to enter; bad timbering is doubtless the cause.

The mines of these different camps are good enough if carefully and legitimately handled, but I must say, frankly, that the greatest curse of this part of the country is *blackmail*. There is a set of cancerous rascals hereabouts who do nothing else but lay around and watch and wait for an opportunity to pounce upon almost every legitimate mining enterprise that is undertaken, causing purchasers no end of trouble, vexation, and annoyance in their rascally endeavors to obtain hush money or be "bought out." These communities ought to be able to discern that every case of blackmail keeps away twenty-five capitalists, who might be glad to invest their surplus funds provided they could get some assurance that as soon as they had gotten fairly under way and spent $10,000 in a plant, they would not be obliged to spend $5,000 more defending some infernal, lying, dishonest, trumped up claim to defraud and cheat them out of their money and their property.

A case in point is that of the *California Boy*. Eastern parties came in and bought the property in good faith, intending to work it legitimately. At the very start a fellow by the name of Brown blackmailed the sale by threatening to "bust it" if he was not paid $1,000. This purse-squeezer was at the same time justice of the peace, having been formerly recorder. No sooner was the sale effected than another leech, Butler by name, I believe, brought suit against the company, claiming to own the *California Boy* by virtue of a prospect he had located previously on the same lode, but which the evidence subsequently showed he had forfeited entirely for not having done the legal amount of work, and he knew it well too. In court Butler swore that the work had been done, and went so far as to produce a receipt to that effect. The man who purported to have given the receipt was put upon the stand and confessed under oath that he *could not write*. In the face of all this evidence the Bench, being no other than the same purse-squeezer Brown, rendered a verdict in favor of the leech Butler. Of course the case was carried to a higher court at Salt Lake City, and Butler, finding he could get no judge to "stand in" with him there, sneaked out like a cur that he was and let the case go by default for non-appearance. But it cost the company considerable money none the less to even prove the fellow a liar and a blackmailer, and they naturally became disgusted with mining, at least around Ophir.

Let the blackmailers be kicked out by the honest men, and when a company does attempt to purchase a mine give them some protection and assurance of good will, and legitimate mine owners here will have no difficulty in disposing of their properties.

Another cause of the depression, especially at Ophir, is the several failures that have occurred here, some of them of a rather questionable character. The miners are promised their wages, and they in turn promise the boarding-house-keeper. who in turn promises the grocer and the butcher, and when the bottom drops out at the mine several barrels become suddenly empty, and all hands are left high and dry.

The dishonest mine superintendents should be kicked out as well as the blackmailers, and with these *Ophir, Dry Canon*, and *Stockton* would be among the best camps in the Territory.

* Fixed carbon + volatile hydrocarbons = 100.

STATEMENT OF BULLION AND ORE SHIPPED FROM SALT LAKE CITY, DURING WEEK SEPTEMBER 22, 1877.

Consignor.	Consignee.	No. Cars.	No. Bars.	Bullion. lb.	Ore. lb.
Germania Works	Hagan & Billing	7	1,645	145,797	....
Highland "	Omaha	1	238	22,193	....
Telegraph "	Pennsylvania	12	2,640	231,221	....
Mingo "	"	4	800	84,181	....
Du Rell "	"	1	240	21,005	....
Morgan "	"	2	473	42,001	....
"	Crookes Bros.	3	713	62,903	....
Frisco "	"	1	255	20,652	....
Du Rell "	Walker Bros.	1	240	20,799	....
Pascoe "	Cook & Co. (Ohio)	1	215	21,922	....
Winnemuc "	Omaha	1	....	....	20,000
Conklin "	Hilliard	1	....	....	22,000
Mackintosh "	"	4	....	....	83,358
Total		39	7,459	693,354	125,358

STATEMENT OF BULLION AND ORE SHIPPED FROM SALT LAKE CITY, DURING WEEK ENDING SEPTEMBER 29, 1877.

Consignor, or Marks	Consignee.	No. Cars.	No. Bars.	Bullion. lb.	Ore. lb.
Waterman	Omaha	7	1,715	143,205	....
Latry & Williams	"	3	806	65,330	....
Germania	Hagan & Bro	10	2,350	208,500	....
Mingo	Pennsylvania	4	800	84,966	....
Morgan	"	2	478	42,020	....
Telegraph	"	8	1,760	167,700	....
Du Rell	"	1	240	20,800	....
"	Cook & Co.	2	480	41,836	....
Dixon	Omaha	1	....	....	20,700
Yosemite	Sacramento	21	....	....	440,000
Mackintosh	Hilliard	1	....	....	19,725
Total		60	8,629	775,467	480,425

ROSE

GAS IN LONDON.

The British Parliament has lately been busied with the legislation demanded by the conflicting claims of gas consumers and producers. The debate and the proceedings in committee have directed attention to some interesting facts respecting the gas companies of London.

At present six corporations furnish all the gas consumed in the British metropolis, each controlling a special district. Formerly the companies numbered thirteen, but in recent years seven have disappeared by a process of consolidation. The half dozen which survive possess an aggregate capital of nearly sixty million dollars. The dividend which, as a rule, they have shown themselves able to pay is ten per cent., which, by the way, is the maximum allowed by law. The seventeen gas factories, which are scattered through all the quarters of the city, use annually more than a million and a half tons of coal, and the amount of gas consumed in London last year was not less than 404,000,000 of cubic meters. The lighting of the streets alone required upward of 54,000 burners, and the principal gas pipes, or mains, presented an aggregate length of more than two thousand miles.

The first London gas company was incorporated in 1810, and still exists under its original name of the Chartered Gas-light and Coke Company. This soon had competitors; in the end, a dozen; but up to 1857 none possessed any exclusive privileges, or the monopoly of a particular district. The companies were at liberty to sell their gas at any price they chose, and could apportion among their shareholders whatever dividend could be earned. They might even interrupt their manufacture when they pleased, and leave the consumer in the dark. Moreover, nobody except the customer troubled himself to investigate the quality of the product fabricated. The competition engendered by this state of things had, of course, some untoward consequences. Several of the public streets were traversed by the mains of not less than four companies, one of which was always tearing up the road in order to repair pipes or connect with private houses. It was difficult for a particular company to distinguish its own main, so that not seldom, when it secured a new customer, it would connect his house with the pipe of another corporation, and proceed to charge for gas which cost it nothing. When a leak occurred, it was impossible to determine, without a general upturning of the street, which company's main was chargeable with the fault. The mischiefs of such a system were so obvious to the companies themselves that finally, in 1857, they came to an understanding and apportioned the business, each reserving to itself a specific quarter, and withdrawing its mains from the rest of the city.

This looked, of course, too much like monopoly to please the British public, and such was the agitation in London on the subject that in 1860 a law was passed sanctioning the distribution of territory, but imposing considerable obligations on the companies. It is worth while to mark some details of this measure which, with some amendments, is still in force, although, as the present movement proves, it is by no means satisfactory to the consumers residing in the metropolitan district. In the first place each company is compelled, under penalty of a heavy fine, to furnish consumers all the gas the latter may require, to supply any resident upon demand, and to extend its pipes through all parts of its own district. The maximum price is fixed at $1.10 per 1,000 cubic feet for a gas having an illuminating power equal to twelve candles, under certain specified conditions as to rate of consumption and size of burner. This, we may here note, is about one-half the cost of the same product in Paris, and very much less, we need scarcely add, than the amount charged in New York. In London, moreover, considerable fines are incurred if at any moment the gas furnished is inferior to the types of purity and illuminating power fixed by statute. By the law of 1860 the maximum dividends assignable to shareholders is 10 per cent., and should larger profits be made a company is authorized to set apart a fraction of the surplus as a reserve fund, but must apply the remainder toward the diminution of the price of gas.

In London, as elsewhere, though with less reason, complaint is made of the arrogant conduct of the gas companies. There, however, bills are presented but once a quarter, instead of monthly, as in Paris and New York, and the bad debts mainly incurred through this delay amount in the course of the year to $70,000, or nearly half of one per cent. of the whole receipts. The quality of the gas made in London is usually good, and several expedients have been employed to maintain it at the statutory standard. There is, for instance, a special court, of which Dr. Tyndall is a member, which decides, in last resorts, questions bearing on this point. Moreover, the product supplied by the several companies is tested every day at different hours by inspectors appointed either by the Corporation of the city proper or by the Central Committee of Public Works. Inasmuch as the latter boards are incessantly quarreling with the companies, we may take for granted that the analysis is carefully performed. Whenever the illuminating power falls short of the legal standard, or where the gas exhibits too great quantities of sulphur or ammonia or the slightest trace of sulphureted hydrogen, the companies are liable to fines, which cannot be charged to general expense account, but must be deducted from the sums assigned to dividends. Nor is it easy to evade this provision, since all accounts and vouchers must be continually open to an inspector nominated by the Board of Trade; and here again we may signalize an auspicious fact in the hostility which exists between the latter authorities and the gas producers. As regards gas meters, they must be tested and approved before serving by officers named by the municipal council. There is to be found, besides, in every district, a special inspector, entirely independent of the companies, whose duty it is, for a trifling fee, to examine the meter belonging to any resident.

From the facts cited it is plain that Londoners have far less cause than most consumers of gas to inveigh against the purveyors of that article. Nevertheless, so strong is the jealousy of monopoly among Englishmen that during the last fifteen years the gas companies have been repeatedly subjected to additional restrictions. At present the price of gas is even lower than that named above, yet a bill was introduced in Parliament last session providing for the purchase of vested rights, and the consolidation of the whole gas production in the hands of the municipality. There is no doubt that the tendency of public opinion in London is in this direction, owing largely to the example of Manchester, where the experiment has been tried with great success. There, while gas is cheaper than in the metropolis, the profits have already defrayed in large part the cost of construction and installation.—*N. Y. Sun.*

MINING NEWS.

NEVADA AND CALIFORNIA.

The Manhattan Company's shipments of bullion for the month of September amounted to $118,492.35.

The Arizona Mine shipped during the same time $23,000.

Reports from the Jackrabbit Mine, near Royal City, (Nev.) indicate the discovery of a very large body of rich ore. The district is not over two hours' ride from Pioche.

A pocket of exceedingly rich silver ore has been encountered in the Mazeppa Mine, Pioche.

The Raymond & Ely maintains a steady yield, and continues a good appearance in the lower levels. There is, however, nothing very remarkable as yet in the mine.

The Alps Company is running full force and full time, and is turning out from its mine plenty of good ore.

The Rye Patch Mining Company has determined to put up a large amount of new machinery at its mine and mill, and, though the expense will be large, dividends will be continued as usual. The appearance of the mine fully warrants these expenditures.

Recent assays from ore taken from the vein recently cut in the bottom drift of the King Mine, give values ranging from $200 to $400 per ton.

In the Ruby Range, between White River and Elko Counties, some mica deposits are being worked with very encouraging results. Some Boston people have taken hold, and it is believed that they can be made very profitable. The mineral occurs large enough to furnish 6x8 sheets.

The De Frees Mine, at Tuscarora, made its first shipment of bullion, valued at $1,300, on October 9.

At the close of the first fiscal year of the existence of the Grand Prize Mine, at Tuscarora, a most gratifying report was submitted by the president of the company. The total bullion produced was valued at $546,585.93. Out of this sum the following payments have been made:

Discount on bullion	$55,460 50
Express charges	6,263 00
Erection of mills, hoisting works, etc.	222,502 56
Supplies	8,558 39
Working expenses, mines and mill	145,944 44
Dividend, No. 1	100,000 00
Cash on hand	7,857 03
	$546,585 93

The cost of mining and milling the ore extracted has been $22.49 per ton Above the third level 1,400 tons of ore are in the stopes. The ore has averaged $78 per ton.

ARIZONA AND NEW MEXICO.

The Risdon Iron Works of San Francisco are building a mill for the Hackberry mine, Mohair Co., and another for the Queen mine, both in Arizona. The material for the 20-stamp mill of the McCracken Company has left the Colorado River and is on its way to the mine.

A $10,000,000 stock company has been organized in California to work placer ground in the Gila Valley.

The owners of the Peck mine have organized themselves into a ten million dollar company to work that vein and a number of others in Bradshaw district.

MONTANA.

At the Alice Mine, Butte, the steam hoisting works are now up and working. The shaft is 160 feet deep, and is being pushed downward steadily. Regarding this very promising mine, and the two equally good adjacent properties, the La Plata and Lexington, which three lodes will themselves alone make a fine camp of Butte, we clip the following from the *Miner:*

"A trestle-work, running from the mine to the mill, is already built, and is to be housed over as a protection from snow during the winter. Upon this trestle-work cars will be run from the shaft and the ore dumped directly into the ore-room of the mill. Thence it will spread over the drying floor until sufficiently dried, and from there it will be passed through the ponderous jaws of a Blake crusher, and fed to the 15-stamp battery, by which the task of crushing will be completed.

"The mine is now provided with two Knowles pumps, one No. 4, the other No. 7. The No. 4 is now in operation. When steam was turned on for the first time, the water in the shaft was lowered 16 feet in six hours. It is the intention of the managers to employ the No. 4 pump until a depth of 200 feet is reached, when the larger one will be put in and the sinking continued. The shaft is now 140 feet deep, and the work of driving it deeper is to begin immediately.

"Messrs. McMinn, McNamee & Gohl have completed the large whim house that they have for some time been erecting over their shaft on the Fraction claim, Rainbow lode, and the double whim inside is in running order. Six men, three on a shift, will be put on soon, and the work of sinking resumed.

"At the western shaft of the Lexington, the foundation for the whim is nearly ready. The whim is already made, and will be put up as soon as the timber cribbing, by means of which a level foundation is prepared on the hillside, is completed."

THE BLACK HILLS.

The *Indicator* of the 17th inst. says: "The Union Pacific Railroad Company is about to build a branch to connect with the Black Hills country, the resources of that locality having demonstrated the necessity of such a road. In the Deadwood district there are three hundred and thirty-five stamps now running, with sixty-five more on the ground and being put up, and one hundred and sixty-five more known to be *en route.* This makes a total of 565 stamps provided for, and there will within twelve months be 2,000 stamps running within eight miles of Deadwood. But putting the number at 1,000, and their product on ore at $15

Section through North Slop

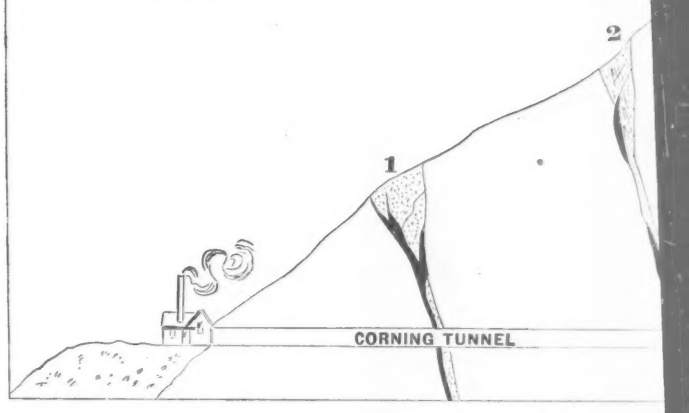
GOLD HILL, COLO

by the

CORNING TUNNEL.

Scale 160 ft. to 1 inch.

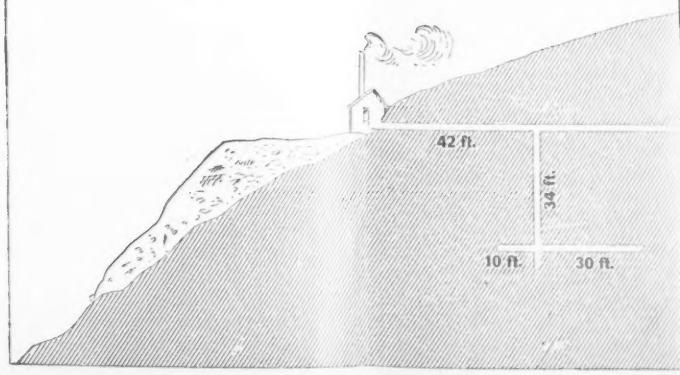
No. 1. Relief Lode
2. Reliance Lode
3. Bonanza Lode
4. Water Lode
5. Dead Lode
6. 475 ft. Lode
7. SLIDE
8. Horsfal Lode



Section of Workings on

SLIDE LODE.

Scale 50 ft. to 1 inch.



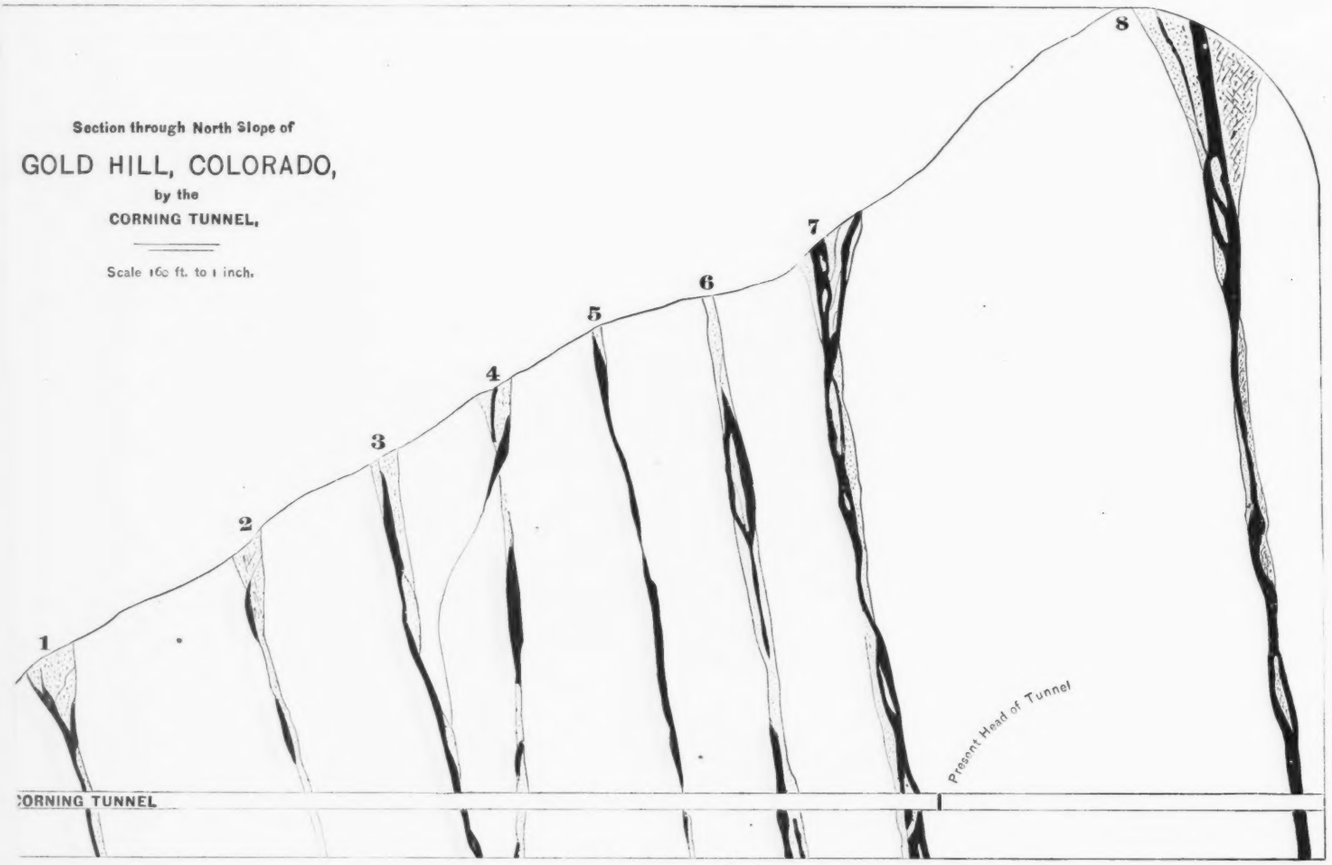
Section through North Slope of

GOLD HILL, COLORADO,

by the

CORNING TUNNEL,

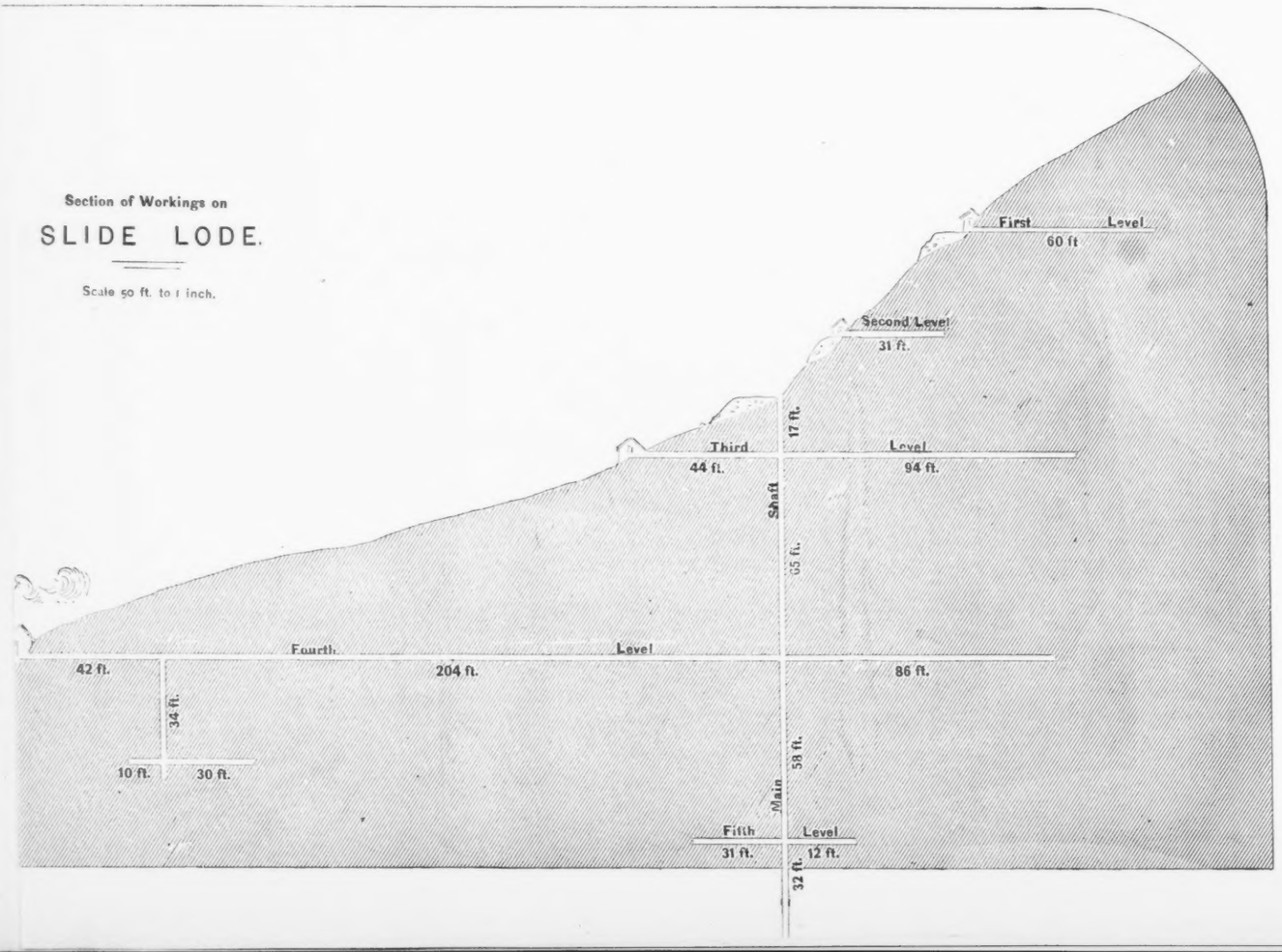
Scale 160 ft. to 1 inch.



Section of Workings on

SLIDE LODE.

Scale 50 ft. to 1 inch.



per ton, each stamp crushing 1½ tons per day would be $22,500 per day, or $6,750,000 per year of 300 working days. Adding to this the placer yield, estimated at $2,000,000, and the yield for 1878 would be $8,750,000. Silver is not included in this estimate, the prospective product of which will be 'considerable, if not more.' It is stated that a narrow-gauge railroad has been organized to build from Deadwood to Central City, with branches up Blacktail, Bobtail, Hidden Treasure, Saw Pit, and Poor Man's gulches."

Black Hills Finances.—Regarding the business of the Black Hills country, the commercial agency of the Mckillop & Sprague Company says:

"The country known to contain valuable deposits is comparatively small. Operations thus far have been confined to a district, the radius of which does not exceed 15 miles from Deadwood. Many quartz mills are already in successful operation, and others in process of erection. The ore easily yields a fair return. The mines are rich and fast being developed. The country is destined to have a rapid and substantial growth. Evidences of wealth are already accumulating, yet there is apparently an inadequate circulation of money to hold business on a cash basis. Our traders have been compelled to extend credits, and at the present time collections are impossible; hence their ability to meet their own obligations to the wholesale trade is seriously doubted. Stocks are generally too large; in some cases are ample for one or two years' trade on the basis of past sales, and, altogether, the commercial outlook is cloudy. The dangers of wholesale credits in new mining regions are here clearly illustrated. Not only is the record of many of those engaged in business a matter difficult to ascertain, but the influences which here surround men of respectable antecedents is demoralizing in the extreme. Deadwood is compactly built, with frame stores on narrow streets, and no insurance is possible. The losses in case of fire would inevitably be total. The enforcement of collections is one great difficulty, for, in addition to the absolute exemption of the homestead without respect to value, and ordinary household goods, the statute exempts from seizure and sale on execution for debt money, goods, chattels, or merchandise to the value of $1,500, and virtually renders the average small tradesman able to bid his creditors defiance. The District Court holds but two sessions in each year. There is, however, a Justice Court having jurisdiction in cases where not exceeding $100 is involved. The attachment law affords a meager remedy, as a writ cannot be issued except upon affidavit that the debtor is about to abscond, or has absconded from the Territory, taking with him his family, or is secreting or disposing, or has secreted or disposed, of his property with intent to hinder and defraud. In such cases wholesale merchants must arrange with responsible parties to go on bonds and for the preliminary costs which are necessarily paid in advance."

THE NOVA SCOTIA COAL TRADE.—The Halifax *Chronicle* of the 12th inst. says: "The cost of coal this season rules unusually low. It is not every autumn, with the prospect of a long winter before them, that the people of Halifax can purchase their supply of genuine 'old Sydney' at five and a quarter dollars per chaldron. Either from neglect or otherwise householders in many cases have, up to the present rather late period in the season, failed to lay in the usual supply for the ensuing winter and spring. This is proven by the sworn city measurers' receipts per capita. As the price paid the measurer is twelve and a half cents per chaldron, it will readily be seen that the usual supply is still short by several thousand chaldrons."

THE IRON MINES OF UTAH.—The *Stock Report* of the 5th inst. says: "From private correspondence we have some interesting information relating to the interests known as Noon's iron mines, situated in Tintic mining district, Utah. The mines are nine miles from a station on the Utah Southern Railroad, and this station is sixty-nine miles south of Salt Lake City."

"Smelting works have been erected near by for smelting lead ores, which are not, however, plentiful in that district. The works are therefore generally idle. The iron ores are black and brown hematites, carrying from 40 to 60 per cent. metallic iron. They are now used for fluxing lead ores, and have completely supplanted and driven out of the market the Wyoming iron ores, formerly imported for the lead smelters in large quantities as flux. The mines are the Vulture, Raven, Vulcan, and Tubal Cain, 1,500 feet each, all near each other.

"The Vulture shows immense bodies of good iron ore, well suited for malleable iron. Noon Bros. have shipped about 2,000 tons for flux at intervals during the past two or three years. The amount of ore now in sight is very large. In the whole group of mines there are doubtless hundreds or thousands of tons, judging from what is in sight and developments so far made.

"The San Pete coal mines and coke furnaces are distant from the railroad about 40 miles, but a narrow gauge railroad is already in course of construction. The coal and coke are of first-class quality. Charcoal can be got in the neighborhood of the mine at low figures. There is manganese in the neighborhood in some of the ores, which would make good steel ores. Soft iron could be produced from most of the ores. Labor and building material are cheap and plentiful. There are some iron works being put up, 150 miles north, by Eastern parties."

THE MISSOURI LEAD MINES.

The Granby *Miner* of the 13th inst. says: "Mining continues this week with increased activity, and the number of miners in Granby now, without a good or fair prospect, is less than at any time for the past three years. We do not mean that the mines are paying better now than ever before, but that necessity has driven away many miners, and that those remaining have better opportunities for good locations. One feature is not flattering, and that is the almost literal strictness with which prospecting is confined to section 6. Very little work is being done in this district outside the section, except upon the Company's land on section 12, and there the activity is not nearly as great as it was a year ago.

"Prospecting, which was so encouraging three or four months ago in the Neosho Mines, is almost entirely suspended, and this is the case with nearly all the new mining localities that promised so well last spring and summer, in different parts of Newton County.

"We are glad to see our miners dispensing as far as possible with much machinery. The low prices of mineral and jack render the most rigid economy necessary.

"The miners seem to fully comprehend the situation, and are now putting in better time and harder licks than they have before for years, and the result is beginning to show at the dump piles.

"Patterson Hollow is a new mining locality, on the west side of the Neosho Road. On the east side of this hollow Silas Crane and the Waughtel boys have a splendid jack prospect, and have now on hand 15 to 20 loads of jack. They can easily turn in 20 to 25 tons per week.

"The ground in this locality is all fresh. No work has been done upon it until February last, and its future is very promising.

"Jones & Bally, who have been working a good zinc prospect for some time, just below Patterson, are now sinking near the head of their lead. Their shaft is down about 70 feet, has already cut through two fair leads of jack, and is now entering the lower and greater lead. Six feet more will let them through. They have also excellent indications of mineral.

"In the Hinton mines, within an area of two or three acres, about a dozen shafts are being worked, the most of which are supplied with good hoisting machines, and all yielding more or less mineral, while several, if worked to their full capacity, would easily yield from 30,000 to 40,000 lb. each. An abundance of water for washing purposes is furnished by a neighboring pump, and conveyed directly to the shafts along a series of troughs.

"The Broadway mines are still producing well, and could be made to yield much better. Messrs. Ferguson, Carson, Allen, and Higgeson, of these mines, are taking out from 30,000 to 40,000 lb. per week, while the yield of some others will not fall far below these figures.

"One advantage our Southwest Missouri mines present over those of any other country is that a class of men, half miners, half farmers, make it profitable to ply both vocations. In the spring and summer they can raise and secure a crop, and when the fall and winter sets in, they can go to the mines and put in a good winter's work to advantage at the most profitable season for mining. For this reason alone, Southwest Missouri mines will always be worked to profit. By reason of facility to market, richness, and the division of labor we have mentioned, the lead and zinc mines will continue to be worked.

"At a recent meeting of about 300 miners at Granby, a petition to the St. Louis & San Francisco Railroad Company was adopted, requesting the company to reduce the freight on lead and zinc ore to St. Louis. It appears that the rate on zinc ore is now eight dollars per ton, and on pig lead about the same figure. This rate bears heavily on miners. The low price of ores (fourteen dollars per thousand on mineral, and seven dollars per ton on jack—the former only a little more than half the usual price paid heretofore, and the latter about half the price paid in Joplin), has made no difference in the price of freight rates."

The Joplin *News* says that "it is stated that there is no market for lead in St. Louis, at even four cents, and that a St. Louis lead commission dealer recently returned from New York, and that he failed to effect any sales even at four cents." At four cents in New York it would be equivalent to about three and a half cents in St. Louis. Neutral mineral is now selling at nineteen dollars per thousand in Joplin.

The West Joplin Lead and Zinc Company has about 400,000 lb. of mineral on hand, and is running its furnaces to their full capacity.

The Joplin Railroad Company is now sending out from their coal-fields about forty car loads of coal per day. The company is increasing its mining facilities, and will soon increase its turn-out to 75 or 100 tons per day.

The large pump that drains the Pitcher Minesin Joplin was destroyed by fire, recently. It is not known whether the fire was accidental or the work of an incendiary. The pump was drawing water from a depth of 180 feet. About 100 miners worked in the diggings drained by this pump. They are now thrown out of employment. It is believed the pump will be again in operation within 60 days.

THE VIRGINIA LEAD MINES.—The Granby *Miner* says: "Lead has been mined and smelted for more than one hundred years at the Wythe Union Lead Works, Wythe County, Va., and this altogether out of surface ores, ranging in no instance at a greater depth than 40 or 50 feet, and only this year has the work been driven below into the fine sulphurets, that appear inexhaustible. In connection with this lead ore are found masses of zinc ore, which have paid mining expenses and a transportation rate of $30 per ton to Trenton, N. J. Capitalists are now considering the profits that must accrue by reducing this ore at the mines. It is certainly astonishing that such shrewd capitalists as now carry on the New Jersey reducing works have not long ago established their works at these mines, and it is equally surprising that the equally shrewd gentlemen who carry on the reducing works at Carondelet for the Missouri mines, and transport crude ore by rail, at an actual expense of $16 per ton (including the dirt and rock shipped with the ore), have not established great reducing works in Southwest Missouri. Only by so doing can the actual wealth of these mines be utilized."

NOTES.

MEASUREMENT OF WATER SUSPENDED IN STEAM.—P. Gazzi, in view of the difficulties introduced into calculations of boiler efficiency by foaming or other mechanical suspension of vapor, has described an apparatus for determining the degree of humidity, as well as for finding the density, either of saturated or of dry steam, at high pressures. His invention was suggested, in part, by the recent investigations of Hirn, Leloutre, and Hallauer.—*Il Politecnico.*

PULSATION AND VIBRATION.—C. A. Bjerknes finds that "simultaneous and synchronous vibrations manifest mean forces of the second, third, and fourth degrees; and for these new apparent forces the principle of equality between action and reaction subsists, while they also show a great resemblance to the forces of nature. Thus two spheres, having concordant pulsations, attract each other inversely as the square of the distance: they repel each other according to the same law if their pulsations are opposed."—*Comptes Rendus.*

PRICES OF IRON AND STEEL RAILS IN GERMANY.—The Berlin *Borsen Zeitung* publishes the following table of prices for Bessemer and iron rails respectively at the times stated during the past four years:

		Bessemer rails. Marks per kilog.	Iron rails. Marks per kilog.
1873	Beginning of the year	41·67	35·80
	Middle " "	39·31	33·63
	End " "	35·42	27·12
1874	Beginning " "	35·60	28·76
	Middle " "	29·85	19·37
	End " "	26·31	18·32
1875	Beginning " "	26·14	18·92
	Middle " "	21·30	17·41
	End " "	19·53	17·50
1876	Beginning " "	18·87	15·31
	Middle " "	16·93	15·00
	End " "	17·75	16·93

CENTRAL RAILROAD OF NEW BRUNSWICK.—The proposed route of this road is from Fredericton, N. B., north by east to the head of Grand Lake, about 40 miles and thence in nearly the same direction to the Inter-colonial at Weldford on the Richibucto, about 50 miles further, with a branch from the head of Grand Lake, southward to the Inter-colonial at Norton, 33 miles from St. John. The road is to be of 3 feet 6 in. gauge, the same as the New Brunswick road, and will open a large section of fertile country, besides furnishing transportation to the coal beds about Grand Lake, which are now only worked to a very small extent, owing to the difficulty of getting the coal to market. A change of location is now advocated with many arguments in its favor. It is, instead of running to Weldford, to build from Grand Lake northeast to the junction of the Carin and Miramichi rivers, about 50 miles, and thence down the Miramichi some 28 miles to the Inter-colonial, from which road a branch extends to Chatham, near the mouth of the river. It is also proposed to extend the Norton branch to St. John, in order to secure better

shipping facilities for coal, and to avoid the necessity for trans-shipment at Norton, and also to complete a rail connection between St. John and the New Brunswick road without change of gauge. The Grand Lake coal is of excellent quality, and it is thought that a large coal business with shipping can be done on the Miramichi, as well as St. John.

THE CANADIAN TRADE IN PHOSPHATE OF LIME.—The *Monetary Times* of the 12th inst. says: "It is stated that the quantity of phosphate of lime or apatite exported from Canada this year will reach 4,500 tons, the value of which in the port of Montreal is close upon $70,000. The trade in this valuable mineral is steadily growing. A shipload of it has been sent this year to Hamburg, and its price on the surface is likewise upon the increase. Not only have rich deposits of it been lately found on lands in Templeton and elsewhere on the Ottawa, and purchased with a view to its development, but it is said that farmers on the Rideau are doing a good deal at mining it on their own lands. More than half the quantity we have named above has been shipped from the latter district. The Montreal *Herald* is authority for the statement that buyers of the article from England and Germany are now in the Montreal market, who are ready to contract for the mineral, and pay cash upon delivery. It is treated in very large quantity in Hamburg, where about 270,000 tons of guano and apatite were last year imported, the latter being converted to superphosphate. The supplies of apatite have come largely from Norway, and from the West India Islands, though we believe a variety of the phosphate has been found in parts of Saxony. Its chemical effect upon land renders it an excellent manure, and while it is well to cultivate an export trade in so valuable a substance, it is important that Canadian farmers should not neglect to use what foreigners appear so anxious to get."

PURCHASE OF THE EMPIRE TRANSPORTATION COMPANY BY THE PENNSYLVANIA RAILROAD COMPANY.—At a meeting of the stockholders of the Empire Transportation Company, at Philadelphia, on the 17th inst., the company unanimously ratified the sale of its property to the Pennsylvania Railroad, the Standard Oil Company, and various prominent oil men, and at midnight its business ceased and passed into the hands of the various purchasers. The Transportation Company only remains in existence long enough to wind up its affairs, which will be done some time during the winter. It received for the property sold $4,596,458.34, of which $2,496,458.34 was in cash and $2,100,000 in bonds. It still possesses other property, consisting of a large amount of oil, open accounts, etc., which are either to be sold or taken on appraised valuations by the various parties purchasing its effects, and which will realize a considerable additional sum. By this sale there passes into the possession of the Standard Oil Company and various oil men all the interests the Empire Company had in transporting by pipe, storing and refining oil, including its interests in the Sone & Fleming Manufacturing Company, the Philadelphia Refining Company, the Empire Pipe Line Company, and the Olean Petroleum Company, for which $1,196,458 in cash is paid. All the rest of the Empire Company's property, including its cars, piers, storehouses, etc., and everything pertaining to transportation, excepting its line of lake steamers, passes into the possession of the Pennsylvania Railroad, who pay for it $3,000,000 in Car Trust and other bonds, secured on the property sold, $2,100,000 of which go to the Empire Company and $900,000 to the Standard Oil Company, who accept these bonds for an equal amount of cash which they yesterday paid the Empire Company. The $900,000 bonds given the Standard Oil Company cover the oil tank cars and other appliances for oil transportation, the trust being held by the Pennsylvania Company for insurances, etc. $1,650,000 of the bonds given the Empire Company cover the cars to be acquired by the Pennsylvania Railroad, the trust being held by the Philadelphia Trust Company, and provision being made for a sinking fund by which ten per cent. of this debt shall be paid off annually. The remaining $450,000 is in railway mortgage bonds, at 6 per cent. gold, and is the price paid by the Pennsylvania Railroad for the wharves, piers, etc., which are quite valuable, especially at New York. The lake line of steamers, known as the Erie and Western Transportation Company, is to have its stock divided *pro rata* among the Empire Company's shareholders, one share being given to the holder of every two of the latter company. When the Empire Transportation Company pays off its debts and divides up its assets, which it will now proceed to do as soon as possible, the President hopes to divide for each share $25 in stock of the Erie and Western Transportation Company, $25 in the bonds above described, and at least $12 in cash, though the latter may be as high as $20 per share. The Empire Company during the last year of its existence earned $2,577,265 from its transportation business, and it will pay also the usual dividend next January, out of its net earnings anterior to the sale, of 2½ per cent. The meeting was entirely harmonious, no objection being made to the proposed sale and winding up of business, which was unanimously ratified. During the twelve years of the company's existence its revenues have been over $101,000,000. The sale will put the Pennsylvania Railroad Company in possession of nearly 5,000 cars of compromise gauge, suitable for any road of customary width of track, including box, rock, and tank cars, capacious depots and piers, two refineries, and about 520 miles of oil-pipe lines, all in active operation, each line being equipped with a private telegraph line.

DEPRESSED CONDITION OF BELGIAN TRADE.—The *Interets materiels* justifies the somber views it takes of trade in Belgium. It does not, says its editor, keep correspondents in its pay, but it goes about itself, week in, week out, seeking what it shall find for its readers to devour, visiting now works at Liege, now those at Charleroi, and interviews managers everywhere, who all, with one accord, declare that the crisis continues, and that the end of it cannot be seen because it is not yet in sight. This same paper analyzes the prices contained in recently-submitted tenders in support of its appreciations, and finds the latter amply justified. On September 5, for instance, tenders were let for 2,978 tons of longitudinal rails, destined for 50 kilometers of Hilfway. The Societe de la Providence tendered at rates the average of which was £5 15s., taking old rails to half the value at £3 4s. per ton. The Societe de Sclessin tendered £5 15s. 4d., without the old rails, or £6 4s., taking half in old rails. The Cockerill, Acoz, and Couillet companies tendered as well. Going back to the prices tendered, and taken in September and October of last year, we find that the Providence Company asked £6 12s. for the first lot of Hilf sleepers, and has, therefore, lowered its rates by 13 per cent. within a twelvemonth. Possibly, however, the company which is the holder of the Hilf patents contents itself with the royalty, the payment of which it wishes to insure by insuring the manufacture of the patented article. The prices got for the steel rails, for this line, are equally disconcerting. For 2,865 tons of rails delivered at Malines, a German firm, the Ruhrort Steel Works, tender £6 12s., making £5 17s. 8d. at the works—a price we never heard of before. The tender of the Angleur Steel Works was £6 15s. 9d., that of the Cockerill Works the same, that of Sclessin £7 5s. 7d. The Ruhrort works wish for payment in money, and will not accept an increase of the order; it is likely, therefore, to go to Angleur. The *Interets materiels* notices that Germans tendering to their own government for steel rails, rarely tender at less than £8 per ton, while they lower prices by 15 or 20 per cent. when they come abroad, and advises them to reverse their proceedings, trimming them in a more patriotic fashion. It is also pointed out that the East Indian Railway Company is likely shortly to ask for fifty locomotives, for a share in which the countrymen of the editor are urged to compete. The liberality which made a Belgian gentleman the official of an English association is evidently not thrown away. There was tried at Liege recently a steam-car on Vaessen's system. It is reported to do its work perfectly well, to make no noise, and to be unattended by either steam or smoke. It has externally the appearance of a car, and shows no part of the machinery. The boiler is tubular; the exhaust steam is fractionated into thirds, one of which goes into the draught, another into the smoke-box, where it absorbs the smoke and sparks, and is driven off by the heat, the remainder being condensed and fed back into the boiler. Industrial shares are still heavy in the market, even zinc shares are neglected. A report on the industrial condition of Hainault has been published by M. Laguesse, and some of his statements have attracted attention. The number of colliery servants employed in 1876 was 1,582 less than the number employed in 1875. The average annual earnings have diminished by £5 15s. per man. But the average annual effect per man has diminished likewise, both above ground and underground. M. Laguesse goes on to show that variations in the productive force of the workman do not depend merely on the perfection of the help given to him, but to a large degree on his own will and his own calculations—that he does, in fact, without being prompted by Mr. McDonald, regulate the rate of his pick by the conditions of the market. When rates are rising he does not fear to exert himself, being assured beforehand that his wages will not be tampered with; but if business slackens his operations do so too, for fear to see a policy of reduction adopted. We thus see the useful effect per man rise in 1866, fall, rise at the busy period of the end of 1869 and the beginning of 1870, fall in 1870 and 1871, to attain a maximum in 1873, and decline afterwards. In the Province of Liege the output went down from 3,551,781 tons in 1875 to 3,367,943 tons in 1876, the average selling price falling from 11s. 4½d. to 10s. 4d., while profits sank from £129,016 to £10,500. The number of workmen declined from 26,429 to 25,723, and the amount paid in wages from £1,186,244 to £1,065,012. The returns for the first half year of 1877 prove that the lowest point in prices had not been touched at the end of June, 1877. The pig-making of the province at 1876 was seriously interfered with by Luxembourg makers, who, with the advantage of ores close in hand, can sell pig for puddling at 36s., taken at the works; both the rivals, however, being beaten in foundry pig by Scotch and English smelters. Iron fell below the low rates of 1870, while for many uses steel came in to replace it. The suggestion is made to ask the state to contract for large supplies at rates which are certain to be low, and pay in treasury, bonds which would probably be sold by the buyers at a profit.—*Iron.*

INDEX OF CURRENT TECHNICAL LITERATURE.

EXCHANGES.

[In this department will be given abstracts of the more important original articles contained in current technical periodicals at home and abroad.]

The following gentlemen have kindly consented to assist in making the reviews of current technical periodicals:

JOHN RANDOLPH, Mining Engineer, New York.
Prof. TROWBRIDGE, School of Mines, Columbia College, New York.
Prof. H. S. MUNROE, " " " " " "
Prof. T. EGLESTON, " " " " " "
ARTHUR F. WENDT, Mining Engineer, New York.
MANSFIELD MERRIMAN, Yale Scientific School, New Haven, Connecticut.
FRANKLIN GURTERMAN, Mining Engineer, Cincinnati, Ohio.
Prof. P. de P. RICKETTS, Ph.D., School of Mines, New York.
Prof. F. C. FUERTES, Cornell University, New York.

Annales des ponts et chaussees. Paris, July, 1877.—On the construction of the bridge over the Mississippi, at St. Louis, by M. Lavoinne. (This article occupies 68 pages, and is fully illustrated; it is the best systematized history of the computation, design, erection, and opening of this great arch with which we are acquainted with)....The improvement of the traction on the canals of the State of New York, by M. Lavoinne, (26 pages, giving a report of the competitive trials made in 1872–3, with a discussion of the different boats and methods of navigation proposed)....Influence of the position of the tie rods on the resistance of circular arches, by Prof. E. Brune, (shows that a marked saving in material will result if the tie can be placed considerably above the springing line)....Statistical table concerning the receipts of French Railroads for the years 1869, 1875, and 1876.

Der Civilingenieur, Leipzig, Nos. 3 *and* 4, 1877.—On the literature of geodesy, by Prof. A. Nagel. (Critical reviews of recent German books)....Investigation of the stability and strength of the walls of cylindrical basins, by Prof. Undeutsch, (a mathematical investigation of value)....On the conversion of circular into rectilinear motion, by Dr. Burmeister (a discussion by means of the Geometry of Position)....On the efflux of the permanent gases according to the hypotheses of Saint-Venant and Wentzel, by J. Illeck....On ventilation and on the methods of testing ventilating apparatus, particularly in railroad cars, by Dr. Weiss....The measurement of oscillations in engineering constructions by means of the level, by Counsellor Kopcke, (on the determination of the actual coefficients of elasticity of bridges and arches from measured deflections)....Rules for the construction of Eyth's expansion cut-off, by J. Schmidt....On the idea "Machine," by T. Beck (a discussion concerning Reuleaux's definition of a machine).

Repertorium fur Experimental-physik, fur physikalische Technik, etc., Munchen, No. 4, 1877.—Dependance of the friction of gases upon the temperature, by J. Puluj, (a record and discussion of numerous experiments)....Record of magnetic observations made in Russia in 1875, by Ivan Smirnow....Plan of a leveling instrument for accurate work and the method of its use, by Dr. Vogler. (Double levels are mounted upon a telescope which turns upon a horizontal axis controlled by a tangent screw)....Experiments upon evaporation, by Dr. Baumgartner (a comparison of theory and practice)....On the practical value of the aneroid barometer for the measurement of heights, by Capt. Neumeyr (discussion of many experiments)....On Merz's calcutta refractor....On a glass circle for angular measurements, by Lewis M. Rutherford (the experiments detailed show that readings with a micrometer microscope on a graduated glass circle, ten inches in diameter, were subject to a probable error of less than half a second). M. M.

Iron. Sept. 29.—Continuous Brakes (calls attention to the confusion resulting from the use of different kinds of brakes on English roads, and calls for the exclusive adoption of some one type)....History of modern invention in the manufacture of iron, (a continued article of interest, gives the history of invention in iron smelting from 1830 to 1833)....The iron stone deposits of South Russia, (continued article translated from *Zeitschrift des berg- u. h. Vereines fur Seiermark u. Karnten*)....On the iron manufacture in the United States, by Richard Akerman (continued article, gives cut of the Bethlehem blast furnace)....Reports of the meeting of the Iron and Steel Institute (discussion of paper on mechanical puddling in Godfrey & Howson's furnace; Improvement in Belgian three high rolls).

Annales des Mines, Paris, January and February, 1877.—There is no original engineering matter in this number.

March and April, 1877.—Notes on a journey in England, by Louis Pellatin. (This paper consists of metallurgical notes made in 1875. It contains sketches of the following works: The Erimus works; Cleveland, with its extensive modification of the Danks process: the Martin steel works at Hullside, near Glasgow, of Landore, near Swansea, and at Dowlais, and the Bessemer Works at Ebbw Vale and Dowlais, and the Washington Bess Works, Cumberland)....Relation between fire-damp explosions and the state of the atmosphere, by Ed. Sauvage (a review of the memoirs by Messrs. Scott and Galloway, in 1871, 1872, and 1874)....Rule of coal dust in fire-damp explosions, by Ed. Sauvage (a partial translation of Galloway's papers which appeared in the proceedings of the Royal Society, 1876)....A study of means of preventing accidents by fire-damp, by M. Soulary. (In gobbing up or letting down the roof in abandoned workings the space is never completely filled, and the interstices between the pieces of gob may amount to one-third to one-fifth of the area of the working so filled. The author considers old workings to be practically reservoirs, in which fire-damp accumulates. When low barometric pressure occurs it tends to expand, and

overflowing into the galleries may render the current of air explosive without any sufficient indication being given by the safety lamp. He suggests means for continuously draining the old workings of fire-damp, and preventing its accumulation, which cannot well be described without drawings. He considers the only way of carrying out such drainage is by drawing it off separately and not letting it mix with the air of the mine)....Dressing of tonic ores at Ammeberg, Sweden, by M. Oppermann. (The Ammeberg zinc mines are near the town of Askersund, and belong to the the Vielle Montagne Company. The blende occurs with gneiss, and is composed of fine grains of feldspar, quartz, and blende, always with a very little galena. Ore containing less than 20 per cent. zinc they do not mine, and some of it contains up to 40 or 53 per cent. Dressing works of similar equipment at the Vilain IV. shaft and the Sencay shaft. Two classes are sent up, poor and rich. The first is broken to size of first by a Blake crusher, and falls on grate; the smalls go on to further operations, but the knockings which fail to pass grade go to a rotary picking table. The rich ore is thrown on a grate, the portion not passing through goes to a rotary picking table, and the smalls through a Blake crusher, from which it enters an elevating wheel of perforated sheet iron, 1 mm. holes, with buckets on the sides, from which the siftings go to concentration, and the remainder being washed in it is raised to handpicking. All the rock goes to crushing rolls, is crushed to 2 m m. and falls into a peculiar double sizing elevator wheel, of which the outer shell is cylindrical, of shell iron, with buckets on the sides, and the inner shell conical, of perforated sheet iron; both shells have helicoidal divisions in the inside. By this wheel the rock of 2 mm. is raised and delivered on one side, and all above 2 mm. is raised and delivered back to the rolls on the opposite side. All the products of the rolls, 2 mm. and under, are classified by Rittinger spitzkasten and spitzlutten. The coarser grains settling in the first kastens are further classified by pyramidal sets of eight trommels, to which they are raised, into sizes of 2 mm.. 1½ mm., 1¼ mm.. 1 mm., and all below 1 mm. The four first are jigged on Utsch jigs of peculiar construction, in which the top layer is discharged from each sieve by a cap and pipe above sieve. These jigs make 135 strokes of 12 to 15 mm. per minute, and receive motion by the ordinary oscillating sleeve. The raggings of the coarser jigs are recrushed on a local pulverizer (Schwartzmann). The spitzkasten are of peculiar construction. The sands from the remaining spitzkasten are classified further in spitzlutten, and are raised for treatment on Hartz jigs, usual pattern, jigging through sieve. An interesting comparison is made by the author of the Hartz and Utsch jigs, with decision slightly in favor of the former. The middle products are rejigged. The slimes depositing in settling tanks and in labyrinths connected with Hartz jigs are treated on Rittinger tables, with 130 strokes per minute, and on concave buddles 2.7 m. in diameter, making one revolution in three minutes. Seventy tons of ore are crushed per day, giving 14 tons of grains to Utsch jigs, 30 tons of sands to Hartz jigs, and 26 tons of slimes to tables and buddles. Cost of crushing 1.10 francs per ton of mineral, and total cost of concentration 18 francs per ton of blende. Jigged stuff from both kinds of jigs runs 40 to 43 per cent. of zinc. Equipments—two breakers, two rotary picking tables, two sets of rolls, two Schwartzmann's pulverizers, six elevator wheels, eleven Hartz jigs, seven Utsch jigs, six Rittinger tables, seven concave buddles, five spitzkasten, two spitzlutten, labyrinths, and clearing tanks. J. C. R.

Berg- u. Huttenmannische Zeitung, July 6, 1877.—Plans for improving the copper works at Balan, by Anton Hauch....The coal formation of Northern Spain, by Wilhelm Kohler....American furnace practice (memoranda)....The Bicheroux furnace. J. C. R.

ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

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ASSAYS.

These assays of gold and silver are reported in dollars and not in ounces, being calculated on the quotation of the metal for the day on which the assay was made. Hereafter the reports will be made in ounces—per ton of 2,000 lb.—as we now do in our New York office.

160. J. J., Bergen District, Colo.—Silver, $2.46; gold, 6·20 oz.; copper, 17·13 per cent.

161. C. C. A., Caribou.—Silver, $161.40.

162. COWNER LODE.—Silver, $18; copper, 52·10 per cent.

163. J. H. S., Hall Valley.—No. 17. Silver, $9.60; No. 18. Silver, $42; No. 19. Silver, $79.20; No. 20. Silver, $2,368.80; No. 16. Silver, $316.50; No. 15, for lead, trace only.

164. J. D. JONES, Mill City.—No. 1. Silver, $126; No. 2. Silver, $35.40.

165. J. H. S., Hall Valley.—No. 17. Copper, trace only; No. 18. Copper, 1·10 per cent.; No. 16. Copper, 1·61 per cent.; No. 15. Silver, $18; No. 27. Silver, trace; No. 26. Silver, $1.20; No. 25. Silver, $10.25; No. 23. Silver, $2.40.

166. G. W. B., Cinc., from Gold Hill.—Gold, $134.52; silver, $22.73.

167. A. S.—No. 1. Gold, $10.34; silver, $12; No. 2. Copper, 7·34 per cent.

168. S. B. M., Denver.—Silver, $618.

169. H.—Silver, $1.20.

170. SMUGGLER.—No. 1. Gold, $4,974.44; silver, $301.20; No. 2. Gold, $241.01; silver, $51.60.

171. CORNWALL.—Black copper, silver, $307.20; green sand, nothing; quartz, silver, $4.68; heavy black copper, silver, $35; heavy black copper, copper, 16 per cent., No. 4; heavy black copper, copper, 39·50 per cent., No. 5.

172. P. G., Cottonwoods.—No. 1. Pacific silver, $34.80; No. 2. Atlantic silver, $97.20; No. 3. Longfellow silver, $10.56; gold, $3.10; No. 4. Dolly Varden silver, $23.04; No. 5. Pacific copper, 62·54 per cent.; No. 6. Longfellow copper, 58·72 per cent.

173. W. S.—Gold, trace; silver, trace.

174. C. R. C.—Silver, $39.60.

175. C. R. C.—Silver, $93.60.

176. W. A. H., Cleveland, Ohio.—No. 1. Silver, $328.00; No. 2. Silver, $189.60; No. 3. Silver, $642.18; No. 4. Silver, $589.20; No. 5. Silver, $681.60.

177. F. L. V.—Silver, $49.80; Lead, 108·00 per cent.

SAMPLES AND QUESTIONS.

178. B. F. G., Darling, Montana.—We owe an apology for having delayed replying to your questions for so long. The samples Nos. 1 and 2 have been carefully examined with the blowpipe for mercury, but none was found. The mineral is mainly, if not wholly, oxide of iron. It may carry gold, but that metal cannot be looked for in pure hematite (oxide of iron) in paying quantities, unless the hematite is simply the surface ore, and results from the decomposition of iron pyrites. In your case, judging from the sample sent and what you say of the vein, we do not think you will find either pyrites or gold (in paying quantities) below. Nos. 3, 4, and 5, have the appearance of copper-stained silver quartz, quite likely to be rich; there is a little galena in one. We noticed nothing else peculiar in the samples.

179. M., Mount Vernon, Colo.—Are you not mistaking an outcrop of stratified granite (gneiss) for a vein? Your ore samples consist wholly of gneiss rock, through which is scattered occasionally a little white iron pyrites. It assays next to nothing. The black streak of ore which gives a red streak is iron ore, not ruby silver. Who is the "Prof." who gave you big assays out of such material? He ought to be known and advertised, for upon the strength of his assay and opinion you have gone ahead and spent much money, which, without doubt, has been utterly thrown away. Before expending any more money, send what ore you have to market and see what it will run. That will show you the value of the opinion.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Oct. 13, and years from Jan 1st.

Tons of 2,240 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
Wyoming Region.				
D. & H. Canal Co.	....	1,283,899	52,231	1,471,495
D. L. & W. RR. Co.	11,337	1,333,095	65,992	1,311,231
Penn. Coal Co.	23,464	746,960	29,089	792,791
L. V. RR. Co.	24,288	647,544	18,402	742,307
P. & N. Y. RR. Co.	....	32,931	....	17,488
C. RR. of N. J.	38,023	914,079	44,704	993,784
Penn. Canal Co.	8,145	251,816	12,166	315,417
	103,257	5,230,324	222,584	5,644,513
Lehigh Region.				
L. V. RR. Co.	88,573	2,567,793	87,075	2,001,133
C. RR. of N. J.	39,028	1,149,792	41,384	1,042,790
D. H. & W. B. RR.	1,416	21,012	2,220	32,324
	129,017	3,738,597	130,679	3,076,247
Schuylkill Region.				
P. & R. RR. Co.	177,303	5,259,390	170,935	3,498,496
Shamokin & Lykens Val.	24,064	565,673	29,475	667,748
	201,367	5,825,063	200,410	4,166,244
Sullivan Region.				
Sul. & Erie RR. Co.	718	14,718	....	27,663
Total	436,359	14,808,702	553,673	12,914,667
Increase	....	1,894,035	....	....
Decrease	117,314	....	....	....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent. of the whole production.

Receipts and shipments of coal at Chicago, Ill., for the week ending Oct. 13, and year from January 1:

	Week. Tons.	Year. Tons.
Receipts	41,058	1,279,926
Shipments	6,013	286,298

Shipments of coal at Pictou, N.S., for the week ending Oct. 13 and year from January 1:

	Week.	Year
To Canada	276	46,305
" United States	556	19,753
" Other Provinces	3,486	60,990
West Indies	483	483
Total tons	4,801	127,531

Coal Cleared on the Canals of the State of New York for the week ending Oct. 15, and years since the opening of navigation:

Tons of 2,000 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
Anthracite	28,574	748,483	27,111	583,594
Bituminous	7,519	210,329	9,480	228,087
Total amount cleared	36,093	958,812	36,591	812,281
Of the above, there was cleared at tidewater ports, viz., New York, Albany, West Troy, and Waterford.	24,845	659,161	11,164	351,109
Cleared at internal ports	11,248	299,651	25,427	461,082

Belvidere Delaware RR. report for week ending Oct. 13.	Week	Year. 1877.	Year. 1876.
Coal for shipment at Coal Port (Trenton)	391	13,139	214,685
" " " South Amboy	12,649	439,769	341,050
Coal for distribution	5,941	146,404	129,231
Coal for Company's use	1,486	56,182	53,981

The shipments of coal at Cleveland, Ohio, for the week ending Oct. 15 were as follows: shipped coastwise, 8,337 tons; total for year, 222,940 tons; foreign shipments, 1,107 tons; total for year, 69,757. Total of coastwise and foreign shipments for week, 9,504; for year, 292,706.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania, Railroads amounts to 129,492 tons, as compared with the corresponding period in 1876.

Perth Amboy business:

	Tons.
Received for the week	35,734
Shipped for the week	24,847
On hand Oct. 13	85,782

The Receipts of Coal at Rondout, N.Y., by the Delaware & Hudson Canal for the week ending October 17 were 69 boats, carrying 8,770 tons.

Receipts of Coal at Boston, for the week ending Oct. 12 and years from Jan. 1.

Tons of 2,240 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
From				
Alexandria and Georgetown	2,410	48,902	1,564	52,708
Philadelphia	6,550	524,622	24,792	466,383
Baltimore	2,788	117,346	6,448	123,695
Other places	1,880	199,823	10,858	238,063
Great Britain	983	6,989	149	4,638
Nova Scotia	2,314	32,899	....	19,506
Total	16,425	930,581	43,811	906,393

The production of Bituminous Coal for the week ending Oct. 13 was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week, Tons.	Year, Tons.
Cumberland Region, Md..		
Tons of 2,240 lb.	38,009	1,188,770
Barclay Region, Pa.		
Barclay RR. tons of 2,240 lb.	7,093	258,664
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.	2,423	106,995
*East Broad Top	957	39,469
Clearfield Region, Pa.		
*Snow Shoe	870	28,523
*Tyrone and Clearfield	27,309	1,016,365
Allegheny Region, Pa.		
*Pennsylvania RR.	2,932	140,241
Pittsburg Region, Pa.		
*West Penn. RR.	4,273	135,697
*Southwest Penn. RR.	637	29,981
*Penn & Westmoreland gas coal, Pa. RR.	23,008	495,772
*Pennsylvania RR.	11,007	276,072

* For the week ending Oct. 7.

The Production of Coke for the weed ending Oct. 7.

Tons of 2,000 lb.	Week.	Year.
West Penn. RR.	837	45,161
Southwest Penn. RR.	13,891	408,394
Penn & Westmoreland Region, Penn. RR.	1,375	48,582
Pittsburg, Penn. RR.	2,077	85,788
Total	18,180	647,925

COAL TRADE REVIEW.

NEW YORK, Friday Evening, October 19, 1877.

Anthracite.

Owing to the resum ption of work in the Lackawanna region, and the announcement of an auction sale of 125,000 tons of coal by the Delaware, Lackawanna, & W estern Railroad Company next Wednesday (the 24th inst.), business has been largely brought to a stand still.

The Delaware & Hudson Canal Company has issued circulars as follows: For Eastern and New York delivery, towing from New York harbor to Rondout and return at expense of the company:

Lump	$2 85	Stove	$3 05
Grate	2 85	Chestnut	2 95
Egg	2 95		

For all points on North River and North, excepting the city and harbor of New York as follows:

Lump	$2 70	Egg	$2 80
Steamer	2 70	Stove	2 90
Grate	2 70	Chestnut	2 80

With this exception, circulars at least remain unchanged, and will receive but little attention until after the auction sale.

Many anticipate a lower range of prices at the sale next Wednesday. Generally a prediction of the course of an auction sale of coal is of little value. In the present case those who look for lower prices may be much disappointed. The close of navigation to many points is very near at hand; in fact to some of the more distant points it is unsafe to ship now. As there has not been an auction sale since June, and as many dealers have been withholding their orders awaiting the resumption of work at all the mines, and as there is something of a demand for this special coal at all times, it is but natural to look for a pretty good attendance at the sale and a liberal aggregate of purchases even though it should be made up of small quantities and to supply only pressing wants. In this event, unless it is the policy of the company to break the market, it will be very easy to maintain prices at or near present circulars.

The general resumption of mining must, however, soon bring about a surplus of coal, and those who can delay purchasing will probably procure cheaper coal during the winter, although in some cases an advance in freights may more than cover the saving in the price of coal.

The Pennsylvania Coal Company, although having sold all the coal it originally intended to ship, will probably continue in the market with a limited quantity for sale.

The Pennsylvania & New York Railroad Company issued circulars dated the 15th inst. reducing its rate on coal from Coxton to Buffalo from $3.26 to $2.82, and to Rochester from $2.91 to $2.53.

The production of anthracite coal for the week ending the 13th inst. was 436,359 tons, or larger than during any week since the beginning of the strike. This is an increase of over 85,000 tons on the previous week, although a decrease of 117,314 tons as compared with the corresponding week of last year. The total output from January 1 was 14,808,702 tons, as against 12,914,667 tons for the like period of 1876, showing an increase this year of 1,984,035 tons. The present week will show an increase over last, while next week will probably equal in quantity that of the corresponding week of last year, after which we may anticipate at least some gain in the excess, for if the market will not take the coal, the stocking grounds are clear.

The strike of the Lackawanna miners, which lasted for nearly three months, practically ended a few days ago, and as a curious coincidence, the Honesdale *Citizen* says:

"The last of the coal on the dock was shipped by canal on Tuesday afternoon. [The total shipments for 1877, by this channel, were 790,598 tons; for 1876, to the same date, 736,930, showing an increase in favor of this year of 53,668 tons. The shipments by Honesdale Branch for 1877, are 265,775 tons; for 1876, to the corresponding period, it was 347,705 tons, a loss of 81,930 tons, as compared with last year.]"

It would thus appear that just as soon as the company was ready to resume, the men were induced to go to work. The men, in cases of strike, are always the heaviest sufferers. They are manipulated by demagogues and paid agitators, and assume the opprobrium of "going out" just when it suits the company to stop mining, and they suffer hunger and privation till it suits the company to have them "go in," when they receive light as to their folly and resume work. Many of the miners left Scranton during the strike, and it is to be hoped that those who remain will now find steady employment. The present wages would give them a fair living, if they could get "full work" and do not allow themselves to be limited by the Miners' Union in the amount of coal a man is allowed to mine for a day's work. As the prospect for a very lively competition between the companies, and consequent low prices of coal, are very promising, there is no probability of any advance in wages becoming possible for many months to come. There is then all the greater necessity for the men to produce all the coal they can, to work all the time they can, and to husband their earnings with thrift and economy, for there is no predicting what prices the future may bring forth if the war between the companies should continue.

Bituminous.

There is but very little business doing in this class of fuel. The Cumberland region lost last week over 1,000 tons, as compared with the corresponding week of last year. For the week ending September 7 the Clearfield region shows a very good output, although the coal is only being supplied to local trade, and upon contracts made early in the year.

New York.

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
*Lackawanna at Rondout	2 85	2 85	2 85	2 95	3 05	2 95
Wilkesbarre at Port Johnston	3 25	3 25	3 25	3 25	3 50	3 00
Plymouth, R. A	....	....	3 25	3 25	3 05	3 15
Pittston at Newburgh:						
A. S. Swords	2 90	2 90	2 90	3 00	3 10	3 00
Penn. Coal Co	2 80	2 80	2 80	2 90	3 00	2 90
Lehigh Coals.						
Old Company at port Johnston	3 75	....	3 40	3 40	3 50	3 00
Old Company's Room Run "	3 75	....	3 40	3 40	3 50	3 00
Sugar Loaf, Hobok & Amb."	3 65	....	3 25	3 25	3 25	3 00
Lehigh at Perth Amboy	3 65	....	3 25	3 25	3 25	3 00
Hazleton at Hoboken	3 65	....	3 25	3 25	3 25	3 00
Lehigh Coal Exchange	3 65	....	3 25	3 25	3 25	3 00
Mount Pleasant at Hoboken	3 65	....	3 25	3 25	3 25	3 00
Cross Creek at Port Johnston	3 25	.	3 25	3 25	3 25	3 00

* These prices are for the city and harbor of New York. For all points on North River and north of Rondout the price is 15 cents less.

Boats towed by the D. & H. C. Co at its expense to and from New York harbor.

	Per ton.
Freight from Hoboken and Weehawken to New York	30@35c
" " Elizabethport & Port Johnston to N. Y.	30@35c
" " South Amboy to New York	30@35c

Freight by the boats of the companies from Hoboken, Rondout, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 50c.

Pittston coal at New York delivered by Penn. Coal Co.'s boats 45c. per ton additional.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$5 50
" " at S. Amboy.	5 00	5 50
Kanawha at Richmond	4 10	5 40
Red Bank Cannel Pa. at Philadelphia	8 00	8 40
Youghiogheny, Waverly Co., at Balt	4 50	5 65
Despard, West Va	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	5 85
Fairmount, West Va., " "	4 40	5 70
Newburg Orrel, Md. " "	4 50	6 00
Cannelton Cannel, West Va	....	10 00
" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond	4 00	5 65
Peytona Cannel W. Va. at Richmond	....	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	2 85@3 10	4 35@4 50
Cumberland, at Baltimore	3 10@3 25	4 35@4 50
Clearfield f. o. b. Canton, Baltimore	3 25@....	4 35@4 50
Clearfield "Eureka" and "Franklin" at mines per ton 2,000 lb.	75c.; f.o.b.	
Baltimore and Philadelphia per ton of 2,240 lb., $3.25; f.o.b. South Amboy, $4.25; alongside at New York, $4.50.		

Foreign Gas Coals.

	Sterling.	Am. cur'cy
Newcastle, at Newcastle-on-Tyne	8/6@10/6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 00
" Gas Cannel "	25/6	10@10 50
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	1 75	4 50
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 60	4 25
Lingan, at Lingan Bay	1 75	....
International mines at Sydney	1 75	4 50
Pictou, Vale mines, at Pictou	2 00	4 75

Buffalo, N. Y. Oct. 15, 1877.

Specially reported by C. M. UNDERHILL.

The following are the prices of Lackawanna, Scranton, Henry Clay and Black Diamond coals, per ton of 2,000 lb, for Buffalo local trade for the present.

	To Dealers. F. O. B.	To Dealers. On car or boat.	To Dealers. In yard, screened.	To Consumers. Delivered at Retail.
Grate	$4 45	$3 95	$4 15	$5 20
Egg	4 45	3 95	4 15	5 20
Stove	4 70	4 20	4 40	5 45
Chestnut	4 60	4 10	4 30	5 35
Blossburg	4 00	3 85	4 35	5 00

Our yards are located as follows: Lackawanna coal at 667 Exchange Street, also at foot of Ohio street. Scranton, Henry Clay and Black Diamond coals at yard foot of Genesee street.

Hamilton, Ont. Oct. 15, 1877.

Specially reported by H. BARNARD.

I beg to hand you state of our market corrected to date.

Grate	$5 25	Lehigh Lump	$6 00
Egg	5 25	Brier Hill	5 50
Stove	5 25	Massillon	4 50
Nut	5 25	Blossburgh	6 00

Montreal. Oct 17, 1877.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per 2,240 lb.

Scotch Steam	$4 00	Cape Breton Steam	$3 25
Pictou	3 75	Newcastle Smith's	5 00

Anthracite at retail, per 2,000 lb. delivered.

Egg	$6 00	Chestnut	$6 00
Stove	6 25		

Philadelphia. Oct. 18, 1877.

Specially Reported.

The trade here is at a stand still. The main business consists in receiving countermands of orders. At the present wages and the high tolls the Schuylkill operators are helpless. There is a good deal of Coal still wanted but the confidence of buyers has been utterly destroyed. The Reading is flooding this market with pea.

Vessels for Eastern ports have been very scarce during the whole week, and $1.40@1.50 are the ruling rates at present to Boston with an upward tendency.

San Francisco, Cal.

From the *Commercial Herald* of Oct. 11, 1877.

COAL—Imports from January 1 to Sept. 1:

	Tons.		Tons.
Anthracite	17,974	Vancouver Island	77,039
Australian	55,159	Rocky Mountain	123
Coos Bay	23,834	Saghalien	40
Cumberland	8,083	Seattle	83,067
English	63,062	Bellingham Bay	8,600
Chili	7,635	Ione, Cal.	2,127
Mt. Diablo,	68,698	Carbondale, Cal.	177

The arrivals from all quarters continue free, and prices favor the buyer. A spot cargo of Wallsend is reported sold at $7.50, while cargoes of Sydney to arrive are offered at $7.50. We note the following arrivals during the week: St. Lawrence, 1,220 tons, from Newcastle, N. S. W.; City of Shanghai, from same, 1,328 tons; Silverhow, from same, 1,750 tons; Shirley with 1,465 tons, Wellington; Clara, 510 tons, Coronel, etc. Since writing the above, we are told of sales of two spot cargoes of Wallsend, at $7.50. From Seattle we have the Modoc with 680 tons, and the Tam O'Shanter with 970 tons.

Our monthly receipts from Mount Diablo mines, for a period of years, are as follows:

Month	1873.	1874.	1875;	1876	1877.
January	13,907	15,145	14,181	8,053	5,303
February	10,447	13,589	14,344	9,047	5,646
March	12,178	14,258	12,355	8,876	6,114
April	11,525	15,048	13,732	7,256	6,742
May	14,714	17,287	10,903	10,137	7,948
June	16,606	17,866	10,185	10,632	8,182
July	14,378	17,790	11,618	10,989	9,480
August	17,040	19,261	12,038	11,270	9,980
September	16,355	20,922	10,356	9,548	9,315
Total	127,150	151,166	109,712	86,408	68,638

Lake Freights on Coal.

The rates given below represent the latest actual charters.

From Buffalo to Chicago	0.30
" " " Milwaukee	0.25
" " " Toledo	0.20
" " " Sandusky	0.25
" " " Detroit	0.25
" " " Port Huron	0.30
" " " Cleveland	0.20
From Cleveland to Chicago	0.50
" " " Milwaukee	0.50
" " " Marquette, Mich	1.00
From Sandusky to Chicago	0.50
" " " Milwaukee	0.45
" Oswego, N.Y., to Chicago	0.65
From Erie to Chicago	0.40

Rates of Toll

For the above we refer to our issue Sept. 8.

For freights on *Lehigh and Wyoming Coal* we refer to our issue of Sept. 15.

For freights on *Schuylkill Coals* we refer to our issue of Sept. 15.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

For the above see issue of Sept. 15.

Towing.

For above rates see our issue of Sept. 22.

OFFICE OF THE PA. & N. Y. R. R. CO., Bethlehem, Oct. 15, 1877.

On and after this date the rate on coal for Buffalo, for Watkins, Ithaca, and Weedsport, for water shipment; Auburn, for New York Central R. R.; Sterling, for Lake Ontario Shore R. R., and Fair Haven, will be $1.03 per gross ton, between Coxton and Waverly. On all coal transhipped at Waverly into broad guage cars, an additional charge of 10 cts. per ton will be made to cover the expense thereof. The full rate from Coxton to Buffalo is $2.82; to Rochester, $2.53.

ROBERT H. SAYRE, President.

Geneva, Ithaca and Sayre Railroad.—The rates of transportation on coal per gross ton from Coxton, subject to regulations printed below, will be as follows:

To East Waverly, N. Y.	$1 75
" Ithaca for C. Lake RR. (local)	1 64
" " for C. L. RR. and for shipment via Erie Canal	1 43
" Geneva (local)	2 25
" Geneva for S. P. and S. and L. O. S. Railroads, and for N. Y. C. and H. R. RR., except Auburn and Cayuga	1 86
To Geneva for Buffalo and Tonawanda	1 61
" " " Genesee Docks	1 65
" " " Charlotte	1 80
" " " Rochester	1 86
" " " Auburn and Cayuga	2 50
Total rate to Buffalo	2 82
" " " Rochester	2 53

REGULATIONS.

A charge of fifteen cents per ton will be collected of each consignee on all coal not unloaded within twenty-four hours after its arrival, and an additional charge of ten cents per ton for every twenty-four hours thereafter; Sundays and legal holidays excepted.

No allowance will be made for coal lost from cars on account of broken doors or other defects existing when the cars are loaded.

Seventeen cents per ton will be charged, at Ithaca Docks, for shipping coal direct from cars to vessels, and 12 cents per ton additional from stock, making a total charge on what is shipped from stock of 29 cents per ton.

All freights will be collected weekly, by drafts on shippers, from Coxton to destination.

ROBERT A. PACKER, President.

SAYRE, Pa., Oct. 13, 1877.

Freights

Representing the latest actual charters up to Oct. 18. Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me.	....	....	....	1 50
Albany	....	....	....	....
Alexandria, Va	70	...	....	....
Brooklyn, N.Y.	95	....	....	...
Bangor, Me.	....	2 00	1 85	1 10
Bath, Me.	....	....	....	1 10
Baltimore	55@65	....	....	....
Boston, Mass.	130@160	175@185	1 85	1 00
Bridgeport, Ct.	95@112	1 50	1 55	55
Bristol, R. I.	....	....	1 55	80
Beverly, Mass.	....	..	....	1 10
Cambridgeport, Mass.	1 40	..	....	1 10
Charleston, S. C.	1 30	....	....	....
Danversport, Mass.	1 30	....	....	....
East Greenwich, R. I.	...	....	....	....
Fredericksburg, Va.	1 20	....	....	....
Fall River	118@120	....	1 55	80
Gloucester	1 40	....	....	....
Georgetown, D.C	65	..	....	.
Hartford, Conn.	1 60	....	....	....
Hoboken	....	....	....	35
Ipswich, Mass.	....	....	....	....
Jersey City	....	....	1 35	35
Key West, Florida	2 50	....	....	....
Medford, Mass.	....	..	....	....
Middletown	....	....	....	..
Milton Mass	1 35	....	....	..
Nantucket, Mass	1 45	....	....	80
New Bedford	1 20	1 65	1 60	80
Newburyport	1 45	2 00	....	1 55
New Haven	95@115	1 50	1 15	55
New London	...	1 50	1 55	65
Newport	1 20	.	....	80
New York	95	1 40	1 45	35
New Orleaus	....		....	...
Norfolk. Va.	75		..	....
Norwich	1 20	....	.	1 04
Pawtucket	1 35	1 65	1 65	90
Philadelphia	....	....	....	...
Portland	115@130	...	....	90
Portsmouth, N. H.	145@160	....	1 95	..
Providence	115@120	1 50	1 55	....
Rockland, Mass.	1 50	....	...	...
Rockport	1 60	....	....	....
Richmond, Va.	80	....	....	....
Saco	1 75	....	...	1 25
Salem, Mass.	1 35	....	....	1 10
Saugus, Mass.	....	....	..	....
Savannah, Ga.	1 40	....	....	....
Somerset, Mass.	1 17½	....	1 55	....
Troy	1 12	....	....	....
Trenton, N.J.	....	....	....	....
Washington	67½@75	....	....	....
Wilmington, N.C.	...	....	...	...
Weymouth, Mass.	1 35	....	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 8c. per bridge extra.

Freights on Bituminous Coal and Coke over the Chesapeake and Ohio Railroad.

To	From New River District, say, at Quinnemont.			
	Bituminous Coal and Coke.			Coal Screenings
	Distances.†	Regular Rate.	Special Rate.	Rate.
	Miles.			
Charleston	75	1 00	70	50
Huntington	127	1 20	80	60
Staunton	158	2 30	2 00	1 50
Charlottesville	197	2 80	2 50	2 00
Gordonsville	218	3 00	2 70	2 40
Hanover Junction	276	3 25	3 10	2 50
Richmond	294	3 25	3 10	2 50
Richmond *via* Hanover Junction	....	3 50	3 35	2 75
James River	297	3 25	3 00	2 50

To	From Kanawha District, say, at Blacksburg.				
	Bit. Coal and Coke.		Cannel Coal.		Coal Screenings
	Regular Rate.	Special Rate.	Regular Rate.	Special Rate.	Rate.
Charleston	80	50	1 20	80	40
Huntington	1 00	60	1 50	1 00	50
Staunton	3 00	2 50	4 00	3 50	2 00
Charlottesville	3 30	2 80	4 25	3 70	2 30
Gordonsville	3 35	2 90	4 40	3 90	2 40
Hanover Junc.	3 40	3 10	4 50	4 10	2 50
Richmond	3 40	3 10	4 50	4 10	2 50
Richmond *via* Hanover Junc	3 65	3 35	4 75	4 25	2 75
James River	3 50*	3 00	4 50	4 00	2 50

* Except splint coal for domestic use, upon which rate to James River for shipment North and East is same as on cannel.

A Terminal charge of ten cents per ton, in addition to rates above, will be collected on all coal and coke at James River. Also, at Huntington, a charge of five cents per ton for transferring by tipple, or ten cents per ton for transfer from car to barge on the river track.

This Tariff supersedes all *Special Rates* on coal and coke to any station, except existing special rates to iron furnaces.

Local Tariff No. 7 will govern rates to all stations, excepting as modified by this special tariff, but the rate to any station between the stations above designated shall in no case exceed the rates named herein to the first point beyond it, of the stations above named.

Special Rates.—The rates given above in columns headed "Special Rates," will apply on all shipments of coal or coke mined or made on the line of this road, destined for use in steam or manufacturing purposes; also on all shipments destined for any point off the line of the Chesapeake & Ohio Railroad.

Agents, when they cannot be certain that shipments are destined for use in steam or manufacturing purposes, will collect freight at regular rates as above, and overcharges, if any occur, will be promptly refunded through the General Freight Office.

A Charge of twenty-five cents per ton, in addition to all rates herein given, will be made for delivery of coal or coke at points *between stations* requiring the use of an engine.

Coal Screenings.—By "Coal Screenings" is meant dust, nut and fine coal that will pass through a screen of one and a half inch meshes, and will only be taken at the company's convenience.

†These distances are computed from Quinnemont (or the New River District.) Blacksburg (or the Kanawha District) lies 56 miles west of Quinnemont, which distance will be added to all coal going east of the New River District and deducted from Huntington and Charleston, which lie west of the same.

☞ Sales of coal are made through the General Coal Agency of the C. & O. RR. Company for shipment from James River, North and East, on a basis of pro-rating net proceeds between the railroad and the mines instead of on fixed rates of freight.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Oct. 19, 1877.

American Pig.—There is still a very good feeling in the trade, although no large sales are reported. We note sales, in lots, aggregating 1,200 tons No. 1 Foundry at $18.50@20 (the latter price for long time), and about 800 tons of No. 2 Foundry at $17@18. In addition to this we learn of sales aggregating about 500 tons of a North River brand of No. 1 Foundry, not strictly prime, however, at $17. This is exceptional, for the market appears to be generally quite firm on the basis of $18 or over for No. 1 Foundry. The Crane Iron Company has started an additional furnace with a Whitwell hot blast. The Carbon Iron Company is being reorganized, and will be supplied with a working capacity to resume operations. We quote No. 1 Foundry at $18@19; No. 2 Foundry, $17@18, and Forge, $16@17.

Scotch Pig.—We note sales of 100 tons of Glengarnock, and 100 tons of Eglinton, in bond, for export to St. Johns, N. B., otherwise business has been confined to small lots. We quote Eglinton at $23.75@24.25; Glengarnock, $24.75@25, and Coltness, $26.

We glean the following from Messrs. John E. Swan & Bro.'s circular dated Glasgow, Oct. 5: The number of furnaces in blast was 87 against 118 a year previous; the stock of pig iron in Connal & Co.'s store was 162,108 tons (the amount steadily increasing, the increase for the week having been 1,207 tons) as compared with 91,616 tons for the corresponding time in 1876. The shipments for the week ending Sept. 29 show a decrease as compared with the corresponding week of 1876 of 3,735 tons. The total shipments from Dec. 25 as compared with the like period of 1875–6, show an increase of 1,263 tons. The imports of Middlesbrough pig for the week ending Sept. 29 shows an increase of 4,848 tons, as compared with the corresponding week of 1876. The total imports since Dec. 25 compared with the corresponding period of 1875–6 show an increase of 53,300 tons. Quotations of No. 1 iron were as follows: Gartsherrie, 61s. 6d.; Coltness, 66s.; Summerlee, 59s. 6s.; Langloan, 63s.; Glengarnock, 59s. 6d., and Eglinton, 55s. Freights were as follows: To New York, 2s. 6d.; Boston, 9s.; New Orleans, 5s.; Baltimore, 8s.; Philadelphia, 7s. 6d.; Montreal, 10s.; Rio Janeiro. 15s.; Buenos Ayres, 30s.; San Francisco, 25s.

Rails.—We are reported sales aggregating 25,000 tons of steel rails at very low prices, deliveries extending into next summer. These were in several lots, but about one-half were for the New York Central Railroad. Quotations are nominally unchanged.

A STEEL COMBINATION.

There is another effort being made to form a combination among the Bessemer steel makers. Some meetings have been held, and another will take place on Monday. The plan proposed so far as we can learn at present is that $2 per ton on all rails manufactured, is to be paid into a general fund, such receipts for the first three months to become a permanent fund, and after that time the receipts to be divided among the eleven companies owning the pneumatic process in this country. A further part of the arrangement proposed is, that the Troy works shall not sell rails at less than $50 per ton f. o. b. at that city; Chicago, not less than $51; Cleveland, not less than $50; and St. Louis, not less than $53. The other mills are not to be restricted in their production or prices.

It is not yet quite clear what advantage will accrue to the restricted works from this arrangement, but it is clear that it would be an exceedingly profitable one for those works which are unrestricted in make or price, and it is equally clear that it would be very disadvantageous to consumers at large.

We reserve further remarks for another occasion.

Boston. Oct. 13, 1877.

Pig well maintans the recent improvement, with a fair degree of activity in every market. There is little speculative movement, the demand running mainly on small lots for consumption. We quote $21.50 for No, 1; $20@20.50 for No. 2, and $19.50@20 for gray forge.

Bar continues unchanged, quoting $43@45 for refined, and $35@36 for common. Nails are in light demand at unchanged prices. Sheet is selling at 3@3¼c. per pound. Russia is quiet at 12c. currency. We quote, English spring steel at 7@8c. gold; 9@11c. for German; 9@11c. for machinery; 14@16c. for cast; 10@12c. for blister; 8c. for American spring; 13½@14c. for cast, 9c. for blister, and 8c. for machine.—*Commercial Bulletin.*

Louisville, Ky. Oct. 16, 1877.

Specially reported by Messrs. GEORGE H. HULL & CO.

Foundry irons continue in good demand, but no change in prices. The usual time, 4 months, is allowed on the quotations below.

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$23 00@24 00
No. 2 " " "	20 00@21 00
No. 1 Southern Charcoal	20 00@21 00
No. 2 " "	19 00@20 00
No. 1 Hanging Rock, Stonecoal and Coke	20 00@22 00
No. 2 " " " " "	19 00@20 00
No. 1 Southern Stonecoal and Coke	19 00@20 00
No. 2 " " " "	18 00@19 00
"American Scotch"	20 00@22 00
Silver Gray	18 00@19 00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral	18 50@19 50
No. 1 Stonecoal and Coke, Cold-short and Neutral	18 00@18 50
No. 2 " " " " "	17 50@18 00
No. 1 Missouri and Indiana Red-short	21 00@22 00
White and Mottled, Cold-short and Neutral	15 00@16 00

CAR-WHEEL AND MALLEABLE IRON.

Hanging Rock. and Cold Blast	34 00@38 00
Alabama and Georgia "	28 00@33 00
Kentucky Cold-blast	25 70@33 00

Montreal. Oct. 9, 1877.

We quote: Pig iron—Eglinton and Clyde, $18.25 to $18.75; Glengarnock, $18.75 to $19.25; Langloan, $19.75 to $20.50; Calder No. 1, 19.75 to 20.50 Summerlee, $18.75 to $19; Gartsherrie, $19.25 to $20; Hematite, $24 to $26. Bars per 100 lb.: Scotch and Staffordshire, $1.85 to $1.90; best do., $2.10 to $2.15; Swedes and Norway, $4.75 to $5; Lowmoor and Bowling, $6 to $6.50.—*Monetary Times.*

Philadelphia, Pa.

[Weekly Report of the Philadelphia Iron Market, furnished for THE ENGINEERING AND MINING JOURNAL, by JUSTICE COX, Jr., & Co., Iron Merchants, 333 Walnut Street, Philadelphia, Week ending Oct. 18, 1877.]

PIG IRON.—The demand for good iron continues, whilst poor iron can only be moved at a considerable

concession on quoted prices. It is reported iron held in New York and elsewhere is very quietly sold to cash buyers at a slight concession. No. 1 and gray forge continue scarce, and bring full quoted prices, whilst No. 2 is in plentiful supply, and a little off price would be accepted for a round lot. We report sales of about 2,500 tons, and quote No 1, $18.50 to $20; No. 2, $17 to $19; gray forge, $16 to $18, and all delivered at Philadelphia.

MANUFACTURED IRON.—The demand for bars continues about the same as for some months, just enough to keep the mills running. In plate and tank there is more inquiry, and prices are held firm with an advancing tendency. In skelp nothing new is being reported, most mills running on orders at very low prices. We quote bars 2 to 2 1-10 cents per lb.; plate and tank, 2 7-8 to 6 cents per lb., and skelp, 2 1-10 to 2¼ cents per lb.

RAILS.—The demand for steel rails continues good, several sales reported this week, but at lower prices. The demand for iron rails is increasing, several large sales reported for delivery up to the first of the year. We quote steel, $41 to $45, and iron, $32 to $35, all at mill.

OLD RAILS.—The demand for old rails as at our last is fully up to the supply, with firmer prices quoted. We quote $19 to $20.

OLD WHEELS continue to press on the market without takers. We quote $18 to $20.

SCRAP.—Wrought scrap is quoted in plentiful supply at low prices. We quote $20 to $25. Cast is quoted $10 to $16.

MUCK BARS are quoted without sales at $32 to $36, at Philadelphia.

Richmond, Va. Oct. 16, 1877.

Specially reported by ASA SNYDER, Esq.

Virginia Cold Blast Charcoal Pig Iron, cold short			$20 to $26
" " " " " neutral			28 to 31
" Warm " " " "			20 to 25
" Anthracite	1 X		20 to 22
" "	2 X		19 to 21
" "	2		18 to 19
" "	Coke West Va.	1 X	22 to 23
		X2	21 to 22

St. Louis, Mo. Oct. 16, 1877.

Specially reported by Messrs. SPOONER & COLLINS, Commission Agents for all kinds of Iron.

Pig iron is still in active demand and sales are good. Prices are still very low, and present prospects show no possibility of an advance. We consider that the bottom has finally been reached, and that any change must be for the better, however the large stocks of iron on hand and for sale in this market will, in a measure prevent any possible advance for some time to come.

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock	25@38	Assorted Bar Iron $2, rates.	
Tennessee	26@30	No. 1 Wrought Scrap 80c. cwt.	
Kentucky	26@30	Heavy cast " 65 "	
Missouri	26@30	Light " " 55 "	
Georgia	26@30	Old rails	19 00 to 20 00
Alabama	26@30	Old car wheels	17 00 to 18 00

	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coal	$22 00	$21 00	$20 00	19 00
" charcoal	22 00	21 00	20 00	20 00
Tennessee charcoal	22 50	21 00	20 00	19 00
Tenn. coke very soft and strong	23 00	21 00	20 00	18 50
Hanging Rock charcoal	25 00	24 00	23 00	.....
" " cold short	24 00	23 00	.....	.....
	Ex No.1	No. 1.	B No. 1.	No. 2.
Alice Hanging Rock coke	$25 00	$24 50	$24 00	$22 50
Quinnimount, W.Va., coke	23 50	23 00	22 00	21 00

METALS.

NEW YORK, FRIDAY EVENING, Oct. 19, 1877.

The past week has been a quiet one compared with several weeks previous. There are no particular features to any of the articles on the list.

Gold Coin.—During the week under review, the price of gold has ranged from 103¼ to 102⅝, and closing at 102⅞.

Bullion.—The silver market has been without any special features the past week, apparently in abeyance upon the reopening next week of the India market and the pending legislation of our Congress. We quote fine silver in this city at $1.18¼; in London, 54¾d.; in San Francisco, 8 per cent. discount.

Daily Range of Silver in London and New York per oz

Date.	London. Pence	New York. Cents	Date.	London. Pence	New York. Cents
Oct. 13	54¾	119	Oct. 17	54⅝	118¾
" 15	54¾	118¾	" 18	54¾	118⅞
" 16	54⅝	118¾	" 19	54¾	118¾

BULLION SHIPMENTS.

We give below a statement showing the amount of the latest bullion shipments, in addition to that announced in our issue of Oct. 13:

Date.	Mine.	Location.	Amount.
Oct. 10	Con. Virginia	Nevada.	$241,834 35
" 10	California	"	113,899 47
Sept.	Standard	"	210,000 00
Oct. 5	Rex Montis	Cal.	10 500 00
" "	Emigrant	"	1,250 00
	Minnietta Belle	"	3,000 00

Statistics of the Production of Gold and Silver.—We take from the Congressional Monetary Commission's report, presented to the United States Senate yesterday, (Oct. 18) the following interesting statistics. This report makes a volume of 200 pages and is the work of the Commission of which Senator Jones of Nevada is Chairman:

"The investigation shows that the product of the Big Bonanza thus far has not exceeded $52,500,000 during the four years that it has been worked, making an average of about $13,000,000, of which 45 per cent. was gold, leaving for the average annual product of silver from this ore body a fraction over $7,000,000. Taking all the mines of the Comstock Lode together during 16 years of unprecedented activity in mining, assisted by the most perfect and powerful mechanical appliances, there have been found some 12 or 13 ore bodies, which have yielded altogether about $240,000,000, or an annual average of $15,000,000, of which about 47½ per cent. or $7,125,000 was gold, leaving $7,875,000 as the average annual production of silver. The silver product of the State of Nevada has been collated only for the six years ending Dec. 31, 1876. During this period the average annual product was $19,000,000, and for the year 1876 by itself only $28,000,000, instead of $100,000,000 as confidently stated by the Reichsanzeiger. The silver product of the United States during the same period was $155,600,000, making an annual average of $26,000,000, the product for 1876 by itself was $38,200,000. When these returns are contrasted with the computations which have hitherto obtained currency, it will be seen that the latter have uniformly and greatly exaggerated the production of silver in this country. It is one of the common estimates that in 1848, the date of the California discoveries, the bullion value of the world's stock of plate, coin, and bars was $2,800,000,000 in gold, and $4,000,000,000 in silver; but of coin and bars alone $1,200,000,000 in gold, and $2,200,000,000 in silver. The total production in gold and silver in the five years ending with 1856 was $950,000,000, being an addition of only 14 per cent. to the total stock, inclusive of plate, or of 28 per cent. to the stock in coin and bars. The total production of gold alone in the same years was $750,000,000, which was an addition of 25 per cent. to the entire stock of gold, including plate, and the still greater addition of 62½ per cent. to the stock of gold in coin and bars. In the 28 years ending with 1875, the aggregate production of gold and silver was $4,582,000,000, which was an addition of 67 per cent. to the stock in 1848 of coin, bars, and plate, and of 135 per cent. to the stock of coin and bars. But in the same 28 years the production of gold alone was 3,215,000,000. This was an addition to the gold stock in 1848 in coin, bars, and plate of 115 per cent., and to the stock in coin and bars of 268 per cent. Estimates of the amount of the world's stock of the precious metals in 1848, or in any year, vary considerably, but on any estimate the two facts are illustrated, that annual supplies affect stocks of the precious metals slowly, and that the stock of either one of the metals is more exposed to eccentric enlargement than is the aggregate stock of the two."

Copper.—We are reported sales of 150,000 lb. of Lake copper, at 17⅞c., and 50,000 lb. at 18c. At the close, 17¾c. is bid for spot copper, and 18c. asked. 18c. is bid for delivery early in November. There is but very little copper offering, while there is even less wanted. London prices are unchanged.

Messrs. von Dadelszen & North of London, under date of October 4, say: Copper has been depressed throughout the month, and Chili bars have again declined about £2 per ton. The tone the last few days is a trifle better. Chili bars, f. o. b., have declined from £67 10s. to £65 10s., our present quotation being £65 10s. to £66. Ordinary named brands are held for £66 up to £67 10s. for best brands. The charters for the first 14 days of September were 1,900 tons, of which 1,150 tons were for the Continent. The imports of Chili copper to Liverpool and Swansea during September were 2,163 tons, and the deliveries 1,818 tons. Ore and regulus are quoted 12s. 6d. to 13s. per unit. Australian has been but little dealt in; Wallaroo is still out of the market, and only trifles sold at from £80 10s. to £81. Burra offers at £74 to £74 5s. English lower, and demand limited. We now quote tough ingot £71 10s. to £73. Select £72 10s. to £74. Sheets £78. At the last Swansea ticketing on 25th September Cape ore fetched 11s. 9¼d, and the whole sale averaged 11s. 6¼d. The following are the stocks:

	Sept. 1st, 1877. Tons.	Oct. 1st, 1877. Tons.	Oct. 1st, 1876. Tons.
Stock, Liverpool & Swansea	18,282	18,627	14,107
" Havre	7,916	7,570	6,550
" London	4,642	4,622	3,732
	30,840	30,819	24,389
Chili produce afloat and chartered by mail and cable	7,000	8,000	12,700
Total	37,840	38,819	37,089
Australian afloat	716	1,200	892

Tin.—London cables Straits at £68 10s.; Penang, on the 16th inst., $19.10 per picul; and Malacca tin at Singapore on the same date, $19.87½. The exports to the United States for the first half of October were 50 tons. The business in this market the past week has been rather quiet, and only in a jobbing way. We quote in gold per lb. as follows: Straits on spot, 16c., and to arrive, 15¾c.; L. & F., 15½c.; Refined, 15⅝c.; and Banca, 18c.

Messrs. von Dadelszen & North of London, under date of October 4, say of Tin: "The market was very dull throughout September, and prices showed little or no fluctuation. Straits ruling at £64 15s. to £65, and Australian at £63 15s. to £64. On the publication of the statistics on the 29th September, the alteration in figures was surprising. The stock here, owing to small arrivals and large deliveries, showing a reduction of about 800 tons. A disposition to buy was at once apparent, and £65 10s. was paid for Australian, to be followed by an advance to £66 on 1st October, and to £66 10s. on 2d. inst. for spot parcels, and for forward delivery £67 to £67 5s. There was a slight relapse yesterday, £66 being the nearest quotation for spot parcels. Straits has quite lost its position as the "Consols" of the market. There are no new supplies coming forward, and the old stock is almost all out of the market, costing holders far above present rates. The quotation is now about £67. How far the alteration in statistics justifies the rise, time alone can show. If the improvement continues, prices will still further advance. Australian supplies do not appear to fall off much, and the wool season will soon come on and offer plenty of ship room and cheap rate of freight. The cable to Australia having broken down, we can only estimate the shipments for September, which we do at 600 tons. The shipments of straits during September were to Great Britain only 30 tons, and to America 390 tons. The delivery from Holland in September was, Banca, 242 tons, Billiton, 192 tons, Australian, 123 tons, and from London, 1,018 tons, exclusive of 103 tons transhipped to America. At the Dutch Trading Company's sale, on the 26th ult., the 21,635 slabs Banca realized f. 40.30, and the 3,499 slabs Billiton, 38¾. English tin was very dull. £68 10s to £69 being the quotation throughout the month. On Monday the smelters advanced the Cornish standard £3, and the price of ingots to £72. Bars, £73. The following are the statistics of foreign Tin, here and in Holland, compared with the three preceding months and the three preceding years:

	Sept. 1st, 1877. Tons.	Oct. 1st, 1877. Tons.	Oct. 1st, 1876. Tons.
Banca on warrants, Holland	937	1,386	1,330
Billiton " "	1,531	1,474	1,008
Australian " "	700	577	795
Foreign tin in warehouse, London	10,090	9,272	7,540
Total available stock	13,258	12,709	10,673
Billiton afloat for Holland	896	800	1,100
Straits " London	100	50	700
Australian " "	2,000	2,100	1,700
Total afloat	2,996	2,950	3,500
Banca arrived for coming sales	14,010	885	1,197
Banca afloat per sailing vessels	71	20	214
Price of straits	£65 00	£66 00	£71 10

Tin Plates.—There has been but a moderate business in these in a jobbing way. We quote in gold per box as follows: Chorcoal tins $6.50, and ternes $6.12½@6.25; coke tins $5.60@5.62½. There are no coke ternes in the market. The nominal price is $5.12½@5.25.

Messrs. Robert Crooks & Co., of Liverpool, under date of October 4, say of Tin and Terne plates: "During the beginning of last month some little trade was done, but not sufficient to maintain prices, which gradually drooped, until, in some instances, the reduction amounted to 1s per box. Even this has not induced buyers to step in, and so dull is the market at date that very little difficulty would be experienced in making contracts, for forward delivery, at lowest prices of to-day. Ternes are, however, quite an exception to this position, and are fairly firm at late quotations. Reason is that, for some time past, Terne making has been so unpopular that the production is now extremely limited."

Lead.—We are reported about 300 tons of lead sold at 4·25c.@4·30c., which may be quoted as the market prices at the close. It is reported that the "Richmond" Company will send considerable of its production to China. It is questionable whether this lead will answer the requirements of the Chinese, but there can be no doubt that the Pacific coast must look to that market for an outlet for a large part of its production, and, furthermore, there is no doubt that a suitable article can be furnished even though the refining so far has not been up to the mark.

Spelter and Zinc.—We quote spelter at 5·80c. @5·87½c.. with but little doing. Sheet zinc is also quiet, and quoted at 7⅝c.@7½c.

Antimony.—This article is quiet and quoted at 12¼c. gold. "Cookson's," however is "cornered" and nominal at 13½c.

Old Rails.—These are without reported sales. We quote as before, $18@19.

Scrap.—We quote at $23@24, without business.

Quicksilver.—The San Francisco *Commercial Herald* of October 11 says: "We know of a single purchase of 1,000 flasks at 45c, and other small purchases have been made at 46c, and 1,500 flasks in lots at 45c. The latest received London quotation notes a rise, now £7 10s per bottle. The City of Sydney for Australia carried 65 flasks, and to New Zealand 5 flasks."

FINANCIAL.

New York Stocks.

NEW YORK, Friday Evening, October 19, 1877.

The business in the coal shares has not been so great this week as last. The "street," as usual, has been full of rumors; the well-worn combination scheme receiving its due attention, while there was also the much more rediculous rumor that Mr. Gowen, the president of the Reading Company, was purchasing Delaware, Lackawanna, and Western railroad stock. Much discussion has been given to the prospects of prices to be realized at the auction sale of coal next Wednesday. Those who sell stock "short" in anticipation of prices much lower than some of the circulars now issued, will probably be caught. The ultimate tendency of the price of coal is downward, but it will be later in the season before it will become marked. The sales of Delaware, Lackawanna, and Western Railroad have aggregated 197,510 shares at 49⅛@52⅞, closing to-day at 51⅛. Delaware and Hudson Canal has ranged from 44 to 41⅛, closing to-day at 43¼. New Jersey Central Railroad has only been dealt in to the extent of 1,195 shares, at 17¾@16¼, closing at 16¼. The condition of the Stock Market is purely artificial, and prices are maintained without any regard to intrinsic value. Investors will wisely let it alone and allow the bulls to gore each other.

Central Railroad of New Jersey.—An order was filed in the office of the Court of Chancery of New Jersey, October 13, authorizing Receiver Lathrop to gradually reduce and finally liquidate certain debts, over one million dollars, against this company by partial payment of interest and principal, and providing for the manner and time of such payment. The creditors have in their possession second mortgage bonds as collateral security for the payment of such debts.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here at Philadelphia, and Baltimore for the week ending the 19th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.

	Quotations.—High-est.	Low-est.	Clos-ing.	Sales Shares
American Coal Co	—	—	35	—
*Cambria Iron Co	—	—	50	—
*Pennsylvania Salt Manf'g Co.	—	—	65	—
*Westmoreland Coal Co	—	—	62	—
*Buck Mountain Coal Co	—	—	25	—
*Schuylkill Nav. Co	—	—	—	—
St. Louis, I. M. & S. RR. Co	9	7	6¼	585
Spring Mountain Coal Co	—	—	30	—
†Balt. & Ohio RR. Co. pref	—	—	—	—
" " " common	—	—	109	—
†Pittsburg & Connellsville RR.	—	—	—	—
†George's Creek Coal Co	—	—	96	—
†Santa Clara Mining Co	—	—	8¼	—
†Atlantic Coal Co	—	—	1.50	—

BONDS.

D., L. & W. 7s, Convt., 1892	J. & D.	—	—	—	—	
" " 2d mtge., 1881	M. & S.	105	—	105'	$3,000	
N. J. C., 1st mtge., new	F. & A.	109¾	109½	109¾	6,000	
" " 1st mt., cons. 1899	Q.	66⅛	65	65⅝	18.000	
" " Convt	M. & N.	63½	63	62¼	33,000	
L. & W. B. Coal Co., cons.	Q.	35½	34½	34½	25,000	
Am. Dock & Imp. 7s	J. & J.	44½	—	—	2,000	
D. & H. C. Co., 1st m., 1884	J. & J.	98½	98¼	97	15,000	
" " " " " 1891	J. & J.	101	100	100½	12,000	
" " " " " 1877	J. & J.	—	—	103⅛	—	
" " " " reg., 1894	A. & O.	96	95¾	95½	15,000	
" " " " coup., 1894	A. & O.	—	—	—	—	
St. L. I. M. & S., 1st mt. 1892	F. & A.	97¼	—	97⅜	2,000	
Ches. & Ohio, 1st mt., 1899	—	24	—	23	1,000	
*L. V. RR., con. m. 6s, 1923	J. & D.	99¼	99	98	8,000	
" " 2d m., 7s, 1910	M. & S.	112	—	112	5,000	
" " reg., 1898	J. & D.	110	—	—	2,000	
" " coup., 1898	J. & D.	—	—	—	—	
*P. RR., 1st mtge., 1880	J. & J.	—	—	—	—	
" Gen. mtge. reg., 1910	A. & O.	106	103¾	106	3,000	
" Con. m. 6s, con.. 1905	J. & D.	—	—	93	—	
" " " reg. 1905	Q.	92½	—	—	5,000	
" gen. M. Coup., 1911	J. & J.	106¾	106	106	3,000	
" New Loan 5s	—	108¾	108	—	11,900	
*P. & R. RR., 7s, 1893	A. & O.	—	—	—	—	
" " con. m. 7s. con. 1911	J. & D.	102	—	102	7,000	
" " Deb. 6s, 1893	J. & J.	—	—	—	—	
" " New convt. 7s. 1893	J. & J.	—	—	—	—	
" " Con. mtge. 7s. reg.	J. & D.	—	—	101⅛	—	
" " 6s, 44-80 1880	J. & J.	—	—	—	—	
*P. & R. C. & I. Co. Deb. 7s	M. & S.	50	—	—	1.000	
*P. & R. C. & I. Co	—	*60	—	—	1,000	
*L. C. & N. Co. 6s. 1884	M. & Q.	104¼	104⅛	104½	1,400	
" " RR. loan 1897	F. & Q.	105	—	104	3,200	
" " Con. mtge. 7s.	J. & D.	—	—	—	—	
" " Cvt. gold, 1894	M. & S.	—	—	93	—	
" "Gold Loan, 1897	J. & D.	90	89	88	7,500	
Schuylkill Nav., 6s. 1897	M. & Q.	—	—	—	—	
Pa. and N. Y. Canal, 7s ..	J. & D.	—	—	109½	—	
Pa. Canal Co	J. & J.	61	—	58	2,000	
Susquehanna Coal Co. 6s.	—	—	—	—	—	
Ches. & Ohio 1st m. 6s..	M. & N.	—	—	—	—	
Balt. & Ohio 6s. 1880	J. & J.	—	—	—	—	
" " 6s. 1885	A. & O.	—	—	—	—	

Total transactions for the week.....$193,000

* Glentworth Tract.

We are without quotations of the Baltimore stock market this week, the quotations above are those which were given in our last:

Philadelphia Stocks.

PHILADELPHIA, FRIDAY EVENING, Oct. 19, 1877.

With the exception of a stationary position in the price of the Reading Railroad stock, the quotations on the Philadelphia market are lower. Pennsylvania Railroad stock has fluctuated from 30½ to 29⅝, closing at 29¾, the sales aggregating nearly 67,000 shares. This decline is supposed to be owing to the purchase of the Empire Transportation line, announced elsewhere in our columns. This arrangement calls for the serious attention of the company's stockholders. About 6,000 shares of the stock of the Reading Company has changed hands, at from 16½ to 15¾, closing at 16¼. Lehigh Valley Railroad, and Lehigh Coal and Navigation Company, have changed hands to the extent of about 2,500 shares each, the final prices showing declines equal to about 2 per cent.

Pennsylvania Salt Manufacturing Company.—The annual meeting of this company will be held on the 24th inst.

The Diamond Coal Company has declared a quarterly dividend of two per cent., or $1 per share, payable on demand.

Westmoreland Coal Company.—22 shares of the stock of this company were sold at auction during the week at $75 per share.

Empire Transportation Company.—100 shares of the stock of this company were sold at auction during the week at 50½ per share, per value $50.

Cayuga Railroad.—It is stated that this road has been transferred by the purchasers at the recent foreclosure sale to the Lehigh Valley Railroad Company. The road is 38 miles long, from Ithaca, New York, to Cayuga N. Y.; has been built several years and has been twice sold under foreclosure, once under the second and lately under the first mortgage.

Hampshire & Baltimore Coal Co.—At the annual stockholders' meeting of this company, held on the 18th inst., for the election of directors and officers for the ensuing year, the following gentlemen were unanimously re-elected: President—J. George Repplier; Vice-President—E. L. Bolles; Secretary—George D. Pond; Directors—E. L. Bolles, George H. Potts, H. S. Henry, George B. Satterlee, James S. Merriam, Edward Oothout, J. George Repplier.

Copper Stocks.

Reported by Wilson W. Fay & Co., Bankers and Brokers Room 7, Traveler Building, 31 State Street.

BOSTON, THURSDAY EVENING, Oct. 18, 1877.

The market has fallen back into its accustomed dullness during the past week, and there have been very few transactions in the stocks.

The market has been alternately brisk and dull for the past two months, leading us, at times, to expect a better state of affairs, and then suddenly falling off again, and showing that the anticipations of a brisk Fall market were premature and unsustained.

But the future, with a few outside orders, will, without doubt, bring about a better feeling, and perhaps a complete revolution. Calumet and Hecla have taken a jump, and is now 176 bid, and the lowest asked is 179. Central holds steady, at 37 bid, and 39 asked.

Copper Falls seems to have dropped out suddenly, 3 being the best bids for it, and the stock offering at 3⅜.

Franklin is quiet and weak at 7¼@7¾. National has sold at 10, and is now 10 bid, and 12 asked; nothing heard as yet from the committee on assessment. In Osceola, Pewabic, Humboldt, Mesnard, Minesota, and Petherick there is no change.

Quincy has rallied and sold at 38½, and is now 38½@39. Ridge has fallen off at 1¾, and is now weak at 1½@1¾.

Duncan has dropped somewhat, there being large quantities sold at 1½. There has been another report afloat about favorable indications at the mine, but it has had no effect upon the stock, the market closing 1⅜@1⅝, but it is likely at any time to spurt up to 2½ or 3. International is quiet and unchanged.

Copper Products for September.—The yield of the Calumet and Hecla Mine for Sep. amounted to about 1,116 tons and of the Osceola about 151 tons.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Oct. 19, 1877.

The stock of the Moose Mining Company has been the feature of the week in the business of the American Mining Exchange. The sales of this stock reach a total of nearly 18,000 shares, which is over one-fourth of the whole business of the Board. The fluctuations do not call for special comment, this large proportion of transactions in the stock of a mine that is but little known here as yet has a suspicious look, especially as the list contains the name of many companies known to every one at all familiar with mining stocks whose shares are almost totally neglected day after day. American Flag, Bertha & Edith, and Lacrosse show dealings amounting to about 9,000 shares each. The stock of the Quicksilver Mining Co. has materially declined under liberal dealings, the transactions in the preferred and common, amounting to 9,300 shares. Seaton has advanced to $1.50 per share from 95c. as quoted a week ago. This advance is based upon a confirmation of the rumor that General Francis L. Vinton has accepted the superintendency of the mine. Ontario closes firm at $23 per share, the sales for the week footing up 2,175 shares. Eureka Consolidated is lower. This company has declared a dividend of $3 per share. The stocks of the Comstock have, as usual, been sparingly dealt in. Elsewhere we give the San Francisco quotations of these stocks, dated Oct. 18th.

Ontario Silver Mining Company.—We give below a statement, showing the receipts and disbursements of this company, from the commencement of operations to the 1st inst.:

RECEIPTS.

1877.	Assay Value.	Sold for.
February	$116,203 53	$109,275 34
March	140,292 12	127,246 06
April	149,210 76	136,747 93
May	136,691 29	125,196 85
June	173,328 85	157,587 09
July	150,044 05	136,974 89
August	165,535 73	151,042 10
September	173,238 31	157,440 64
	$1,204,544 64	$1,101,510 90

DISBURSEMENTS.

1877.		Dividends.	Expenses.
Jan. & Feb.			$29,073 85
March	No. 1.	$50,000	49,860 80
April	" 2.	50,000	27,434 75
May	" 3.	50,000	2,176 35
June	" 4.	50,000	91,012 76
July	" 5, 6, 7.	150,000	47,015 01
August	" 8.	50,000	42,686 06
Sept.	" 9, 10.	100,000	*67,856 95
		$500,000	$357,116 53

$857,116 53

Gold balance, Oct. 1, 1877.....$244,394 37

Nos. 6, 7, and 10 extra dividends.

* The expenses for September increased on account of the purchase of winter supplies.

The total production of the company from the 1st to the 12th day of October inclusive, was 32 bars of bullion, having an assay value of $66,310.05.

MINING STOCK QUOTATIONS IN SAN FRANCISCO.

We give below a table showing the closing price of mining shares in San Francisco yesterday:

Alpha	14	Mexican	12⅛
Belcher	5⅜	Northern Belle	16¼
Best & Belcher	23⅛	Ophir	17⅜
Bullion	11½	Original Comstock	..
Caledonia	4	Overman	24¾
California	31	Raymond & Ely	9¾
Chollar Potosi	36	Santiago	..
Con. Imperial	1¼	Savage	10¾
Con. Virginia	32	Seg. Belcher	42
Confidence	6¼	Sierra Nevada	5¼
Crown Point	6	Silver City	..
Eureka	45¾	Silver Hill	2
Exchequer	10½	South Comstock	..
Gould & Curry	11¾	South California	..
Hale & Norcross	7⅜	Southern Star	..
Indian Queen	..	Trenton	..
Julia	3¼	Union Con	7
Justice	14	West Belcher	..
Kentuck	7½	Yellow Jacket	10¾
Kossuth	..	Young America	..
Leopard	1		

The *Commercial Herald* of the 11th inst. says of the Mining Share Market in San Francisco: "The amount of low-priced stocks that are now being brought to the front absorb most of the time allotted to each session of the boards, and those off the Comstock are coming forward with a perfect rush. So large a percentage of operations in these 'wildcats,' as they were formerly universally denominated, has never before been known. They seem to have acquired more respectability, and one thing is true that the profits, when a good deal can be made, are very large, for if a fifty cent stock advances to a dollar the investment is doubled, which is rarely the case with high-priced stocks, though the intrinsic value of the latter may be safely counted on. The public seem to understand this better than formerly. However, developments in outside claims seem to have something to do with this more than usual movement in that class of stocks. In carefully looking at all the features of the market, it would appear as if the present activity might result in a still stronger movement, and that better prices would be the consequence."

The Gold Hill *News* of the 10th inst. summarizes its mining news as follows: "The ambitious rivalry evinced in trying to get a bonanza at the south or Gold Hill end of the great lode, to offset the big bonanza of the north end has weakened a little, but is liable to revive with increasing good prospects. The Divide is the fulcrum for the sea-sawing plank, and beneath this fulcrum the Schultz mines are showing good bottom and increasing good prospects. The new Yellow Jacket works, at the new shaft of the company, a couple of thousand feet east of Gold Hill proper, have just started into operation, and the machinery works as well as could be wished. These works are among the most powerful and effective on the Comstock, and the shaft is the best and most advantageously located of any in the southern section, a point which will be realized in a year or two from now. The Baltimore as well as many other mines in the southern section of the Comstock is starting work again and good ore developments are to be looked for. More ore is being constantly developed in new quarters in the Bonanza mines, and the milling capacity is not equal to the ore production."

"Connection was made on the 8th inst. between the Gould & Curry Mine on the 1,900-foot level, and the joint winze on the Savage line. This gives a fine circulation of air at that depth, the draft being southward through the Curry, and up through the joint winze. It is a very important connection, as it opens up in the Curry Mine for crosscutting and prospecting 400 feet of new ground. Before this connection was

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.		Feet on Vein.	Capital Stock	Shares		Assessments.				Dividends.					Highest and Lowest Quotations per Share in Currency.										Sales
				No.	Par Val.	Total levied to date.	Date and amount per share of last.			Total paid to date.	Last Dividend.			Rate per Ann.	Oct. 13.		Oct. 15.		Oct. 16.		Oct. 17.		Oct. 18.		Oct. 19.		
															H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Coal Stocks.			$			$	Mo.	Yr.	Amt.	$	Mo.	Yr.	Amt.	Per cent.												
Consol. Coal	Md.	....	10,250,000	102,500	$100	*	.....	....	.....	....	Jan..	1877	2½	10	..	..	..	..	..	..	..	..	..	..	..	.....
Del. & H. Canal	Pa.	....	20,000,000	200,000	100	*	.....	....	.....	38,821,104	Aug.	1876	4	8	42⅝	41¾	44	42	43½	42¾	42⅞	41½	43	41¼	43½	43	12,111
Del., Lac. & W.RR.	Pa.	....	26,200,000	524,000	50	*	.....	....	.....	....	July	1876	2½	5	51⅛	49⅛	52⅜	49⅜	52⅜	50¾	51⅜	49⅛	51⅛	49	52¾	50⅞	197,510
Lehigh C. & N.	Pa.	....	10,448,550	208,971	50	*	.....	....	.....	....	Sep.	1876	1¾	0	19	19	19¾	19	19½	19	..	..	19	18⅜	18⅜	18⅜	2,557
Lehigh Valley RR.	Pa.	....	27,042,900	540,858	50	*	.....	....	.....	....	Sep.	1877	1	5	40	39⅛	40	39¾	40	40	39½	38¾	39	38¾	39	39	2,743
Maryland Coal	Md.	....	4,600,000	44,000	100	*	.....	....	.....	....	Jan..	1876	1½	1½	..	..	..	..	..	..	..	..	..	..	..	..	.....
N. J. Central RR.	Pa.	....	20,600,000	206,000	100	*	.....	....	.....	....	Apr.	1876	2½	10	17	17	17¾	17½	17½	17	17½	17	17	16½	16¾	15¼	1,195
Penna. Coal	Pa.	....	5,000,000	100,000	50	*	.....	....	.....	....	Aug.	1877	3	12	..	..	..	..	..	..	..	..	..	..	..	..	.....
Pennsylvania RR.	Pa.	....	68,868,700	1,377,376	50	*	.....	....	.....	....	May.	1877	1½	10	30¼	30⅛	30⅝	30⅜	30⅜	29⅞	30	29¾	29⅝	29⅛	29¾	29¾	66,713
Phil. & Read. RR.	Pa.	....	34,278,755	685,575	50	*	.....	....	.....	....	Jan..	1876	2½	..	16⅝	16¼	16½	16¼	16¾	16⅛	16⅜	15⅞	16	15¾	16⅝	16⅛	5,959
General Mining Stocks																										
Alpha Cons. g. s.	Nev.	300	3,000,000	30,000	100	210,000	Aug.	1877	$1 00	....	.....	....	.....	..	..	..	..	..	14¾	..	15¼	..	15	..	14⅝	..	400
Am. Flag, g	Colo.	5,300	600,000	50,000	10	*	.....	....	.....	....	.....	....	.....	..	13c	..	11c	10c	..	..	12c	11c	15c	10c	12c	..	9,300
Belcher. g s.	Nev.	1,040	10,400,000	104,000	100	1,072,400	Sept	1877	1 00	15,397,200	Apr.	1876	$1 00	12	6¼	..	6	..	..	..	..	..	..	..	..	..	300
Bertha & Edith g	Vir.	645 acs.	3,500,000	350,000	10	*	.....	....	.....	....	.....	....	.....	..	12c	11c	13c	11c	15c	12c	12c	..	12c	11c	12c	10c	9,000
Best and Belcher, g. s.	Nev.	545	10,080,000	100,800	100	337,792	Aug.	1877	1 00	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	24¾	..	100
Bobtail, g	Colo.	2,500	1 136,630	227,326	5	*	.....	....	.....	....	.....	....	.....	..	3	..	..	..	2¾	..	..	..	..	..	..	..	300
Bobtail Tunnel, g	Colo.	..	100,000	20,000	5	6,000	July	1873	0 30	20,000	Dec..	1876	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Bullion, g. s.	Nev.	943⅛	10,000,000	100,000	100	2,762,000	Oct.	1877	1 50	....	.....	....	.....	..	12¼	..	12⅜	..	11¾	..	11½	..	11½	11	12	..	1,200
Caledonia, g. s.	Nev.	2,188	10,000,000	100,000	100	1,360,000	June	1877	50	....	.....	....	.....	..	..	..	..	..	..	..	..	..	4	..	4	..	200
California, g. s.	Nev.	600	54,000,000	540,000	100	....	.....	....	.....	18,360,000	Sept	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	.....
Cholar Potosi, g. s.	Nev.	1,400	2,800,000	28,000	100	1,496,000	Oct.	1877	3 00	3,080,000	Feb..	1872	1 00	12	..	..	..	..	..	..	..	..	..	..	..	..	.....
Cleveland, g.	Colo.	3,715	250,000	25,000	10	*	.....	....	.....	....	.....	....	.....	.	..	..	7½	..	..	..	..	..	7⅜	7⅜	7¾	6	5,100
Cons. Hercules & Roe.	Colo.	16,500	1,000,000	100,000	10	*	.....	....	.....	120,000	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Cons. Imperial. g. s.	Nev.	468	50,000,000	500,000	100	475,000	May.	1877	0 20	....	.....	....	.....	..	..	..	..	..	..	..	1	..	1	..	..	..	200
Con. N. Slope & E.C.T.	Colo.	15,000	500,000	10,000	50	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Cons. Virginia, g. s.	Nev.	710	54,000,000	540,000	100	474,600	June	1873	3 00	32,400,000	Sept.	1877	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	.....
Confidence, g. s.	Nev.	130	2,496,000	24,960	100	243,840	Mar.	1873	1 00	78,000	May.	1865	8 ⅓	..	6¾	..	6¼	..	6¼	6⅛	6½	..	6½	..	6¼	..	1,300
Crown Point, g. s.	Nev.	600	10,000,000	100,000	100	1,573,370	Sept.	1877	1 00	11,588,000	Jan..	1875	2 00	24	..	..	..	..	..	..	..	..	..	..	..	..	.....
Douglas	Colo.	21,000	1,000,000	10,000	100	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Eureka Cons. g. s. l.	Nev.	..	5,000,000	50,000	100	100,000	May	1876	1 00	1,000,000	Aug.	1875	1 00	..	50⅜	..	50¼	50⅛	..	..	48	..	..	..	..	..	450
Eureka G. Mg. g	Cal'f	....	2,000,000	20,000	100	....	.....	....	.....	2,134,000	Aug.	1877	2 00	..	..	..	..	..	..	..	..	..	..	..	..	..	200
Exchequer, g s.	Nev.	400	10,000,000	100,000	100	280,000	Sept.	1876	1 00	....	.....	....	.....	..	..	..	10½	..	..	..	..	..	..	..	..	..	.....
Gould and Curry, g. s.	Nev.	621	10,800,000	108,000	100	2,352,000	Aug.	1877	1 00	3,934,800	Oct..	1870	10 00	..	11	..	..	..	11½	..	11¾	..	11¾	..	11⅛	..	100
Granville Gold	N. C.	9,000	1,000,000	100,000	10	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	1,000
Hale & Norcross, g. s.	Nev.	400	11,200,000	112,000	100	2,734,000	Oct.	1877	1 00	1,598,000	Apr.	1871	1 00	12	7¾	..	..	..	7⅞	..	7½	..	7⅞	7¾	..	..	500
Henry Tunnel	Nev.	3,000	2,000,000	80,000	25	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Hukill, g. s.	Colo.	3,288	1,000,000	100,000	10	*	.....	....	.....	90,000	Oct..	1877	0 10	12	..	..	..	..	..	..	4½	4⅜	4½	4⅜	4¼	..	300
Indian Queen, s.	Nev.	1,000	3,000,000	60,000	50	*	.....	....	.....	60,000	Dec..	1875	0 50	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Julia Cons.. g. s.	Nev.	3,000	11,000,000	110,000	100	440,000	Aug.	1877	1 00	....	.....	....	.....	..	3¾	..	3¾	..	3½	..	..	..	3¾	..	3¼	..	900
Justice, g. s.	Nev.	2,100	10,500,000	105,000	100	1,817,500	Aug.	1877	1 50	....	.....	....	.....	..	..	..	..	..	..	..	14	..	..	..	14¼	..	200
Kentuck, g. s.	Nev.	95	3,000,000	30,000	100	270,000	Dec..	1874	1 00	1,252,000	Mar.	1870	5 00	..	..	..	..	..	6¾	6½	..	..	7¾	..	..	..	300
Kossuth, g. s.	Nev.	2,700	5,400,000	108,000	50	421,200	Aug.	1877	0 15	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Lacrosse	Colo.	3,900	1,000,000	100,000	10	*	.....	....	.....	....	.....	....	.....	..	33c	31c	33c	31c	31c	..	31c	..	..	..	31c	..	9,200
Leopard, L. g. s.	Nev.	1,500	5,000,000	50,000	100	100,000	July.	1877	50	162,500	Dec..	1876	0 50	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Lucerne Mining	Colo.	4,200	5,000,000	500,000	10	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Mariposa, preferred	Cal.	44,387	5,000,000	50,000	100	1,425,000	June	1877	1 00	....	.....	....	.....	..	1¼	1	⅞	..	..	..	..	..	3	..	..	..	.....
" common	"	acres.	10,000,000	100,000	100	1,425,000	June	1877	1 00	....	.....	....	.....	..	1	⅝	¾	..	..	..	..	..	10	..	..	..	1,005
Memphis	Colo.	6,000	300,000	60,000	5	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	850
Merrimac, s.	Mass.	1,500	500,000	50,000	10	*	.....	....	.....	85,000	Sept.	1877	40c	12	..	..	..	..	..	..	..	..	..	..	..	..	100
Mexican, g. s.	Nev.	600	10,080,000	100,800	100	181,440	Aug.	1877	0 30	....	.....	....	.....	..	..	..	12¼	..	12¼	..	12¼	..	12¼	..	12¾	..	700
Moose	Colo.	39,000	2,000,000	200,000	10	....	.....	....	.....	50,000	Sept.	1877	0 25	..	6¾	6¼	6¾	6	6¼	6	6¼	6	6¼	5⅞	5⅞	..	17,850
N. Y. & Colo., g.	Colo.	....	1,000,000	50,000	20	*	.....	....	.....	20,000	Mar.	1877	0 20	..	2⅜	2¼	2¼	2⅛	2⅛	2¼	2⅛	2⅛	2⅜	2¼	..	..	2,800
Northern Belle, s.	Nev.	1,600	5,000,000	50,000	100	....	.....	....	.....	1,350,000	Aug	1877	1 00	..	..	..	19¾	..	..	..	..	..	..	..	..	..	200
Ontario.	Utah	3,000	10,000,000	100,000	100	....	.....	....	.....	550,000	Oct.	1877	50	6	22⅝	22½	22¾	22⅝	23	22⅝	22⅞	..	..	23	..	2,175
Ophir, g. s.	Nev.	675	10,080,000	100,800	100	2,934,400	May.	1875	2 00	1,394,400	Mar.	1874	4 00	..	18⅜	..	..	..	..	..	..	..	18½	..	..	..	200
Original Comstock, g. s.	Nev.	..	10,000,000	10,000	100	....	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Overman. g. s.	Nev.	1,200	3,840,000	38,400	100	9,452,680	June	1877	3 00	....	.....	....	.....	..	..	..	..	..	25⅜	..	..	..	25¾	..	25¾	..	300
Pleasant View, g	Colo	1,200	200,000	20,000	10	*	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Quicksil. preferred	Cal.	8,500	4,291,300			*	.....	....	.....	....	.....	....	.....	..	37	35	36½	34½	36⅜	33	37	35	34	..	36½	34½	6,698
" common	"	acres.	5,708,700	100,000	100	.....	.....	....	.....	....	.....	....	.....	..	21½	..	22	21	20	19	18	..	..	..	19	18	2,600
Raymond and Ely, g. s.	Nev.	5,000	3,000,000	30,000	100	540,000	Dec.	1876	1 00	3,075,000	Sept.	1873	3 00	..	..	..	11	..	..	..	..	..	..	..	..	..	100
St. Joseph, L.	Mo.	2600 acs.	1,000,000	100,000	10	....	.....	....	.....	250,000	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Santiago, g. s.	Nev.	2,000	11,200,000	112,000	100	....	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Savage, g. s.	Nev.	800	11,200,000	112,000	100	3,408,500	Sept.	1877	1 00	4,460,000	June	1869	3 00	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Seaton, g. s.	Colo.	1,700	500,000	50,000	10	*	.....	....	.....	10,000	May.	1877	0 10	12	1.05	..	1.30	1.10	..	..	1.45	..	1.50	1.45	..	..	900
Seg. Belcher. g. s.	Nev.	160	640,000	6,400	100	244,800	Apr.	1876	5 00	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Sierra Nevada g. s.	Nev.	3,650	10,000,000	100,000	100	1,750,000	Aug.	1877	0 50	....	Jan..	1871	1 00	..	..	..	5¼	..	..	..	..	..	..	..	..	..	700
Silver City, g s.	Nev.	3,900	6,310,000	63,100	100	15,775	Nev.	1876	0 25	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Silver Hill, g. s.	Nev.	5,400	5,400,000	54,000	100	972,000	July.	1877	1 00	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
South Comstock, g. s.	Nev.	1,500	10,000,000	100,000	100	54,000	Jan	1877	0 25	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
South. California, g. s.	Nev.	1,500	5,000,000	50,000	100	....	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Southern Star. g. s.	Nev.	1,500	6,000,000	600,000	100	....	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Trenton, g. s.	Nev.	..	10,000,000	100,000	100	....	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Union Cons., g. s.	Nev.	850	10,000,000	100,000	100	260,000	Mar.	1876	1 00	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
West Belcher, g. s.	Nev.	1,000	10,000,000	100,000	100	....	.....	....	.....	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Yellow Jacket, g. s.	Nev.	1,200	12,000,000	120,000	100	1,198,000	Sept.	1877	2 00	2,184,000	Aug.	1871	2 50	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Young America, s.	Nev.	1,000	3,000,000	30,000	100	6,000	Oct..	1876	0 20	....	.....	....	.....	..	..	..	..	..	..	..	..	..	..	..	..	..	.....
Copper Stocks.																										
Allouez, c.	Mich	..	1,000,000	20,000	50	940,000	May.	1876	5 00	....	.....	....	.....	..	....		....		....		....		....		....		.....
Calumet & Hecla, c.	Mich.	..	2,000,000	80,000	25	1,200,000	.....	....	.....	11,850,000	Aug.	1877	5 00	20	....		....		....		....		....		....		.....
Central, c.	Mich.	..	500,000	20,000	25	100,000	June	1862	0 65	1,160,000	Feb.	1877	7 00	28	....		....		....		....		....		....		.....
Copper Falls, c.	Mich.	..	1,000,000	20,000	50	535,000	May.	1876	.....	100,000	Nov.	1871	1 00	..	....		....		....		....		....		....		.....
Dana, c.	Mich.	..	500,000	20,000	25	68,000	Jan..	1863	0 50	....	.....	....	.....	..	....		....		....		....		....		....		.....
Dawson, s.	Ont..	..	1,200,000	60,000	20	....	.....	....	.....	....	.....	....	.....	..	....		....		....		....		....		....		.....
Duncan, s.	Ont..	..	1,200,000	60,000	20	75,000	July.	1876	41⅔	....	.....	....	.....	..	....		....		....		....		....		....		.....
Franklin, c.	Mich.	..	500,000	20,000	25	360,000	June	1876	5 00	585,000	Nov.	1871	1 00	..	....		....		....		....		....		....		.....
Humboldt, c.	Mich.	..	500,000	20,000	25	100,000	Sept.	1876	0 15	....	.....	....	.....	..	....		....		....		....		....		....		.....
International, s.	Ont..	..	1,200,000	60,000	20	....	.....	....	.....	....	.....	....	.....	..	....		....		....		....		....		....		.....
Madison, c.	Mich.	..	500,000	20,000	25	123,000	Sept.	1876	0 10	....	.....	....	.....	..	....		....		....		....		....		....		.....
Mesnard, c.	Mich.	..	500,000	20,000	25	160,000	Apr.	1876	0 50	....	.....	....	.....	..	....		....		....		....		....		....		.....
Minesota, c.	Mich.	..	1,000,000	20,000	50	436,000	June	1869	1 00	1,820,000	Mar.	1876	0 50	..	....		....		....		....		....		....		.....
National, c.	Mich.	..	500,000	20,000	25	195,000	Oct..	1875	1 00	360,000	Oct..	1873	1 00	..	....		....		....		....		....		....		.....
Osceola, c.	Mich.	..	1,000,000	40,000	25	880,000	May.	1876	2 00	....	.....	....	.....	..	....		....		....		....		....		....		.....
Petherick, c.	Mich.	..	500,000	20,000	25	165,533	Mar.	1876	0 50	....	.....	....	.....	..	....		....		....		....		....		....		.....
Pewabic, c.	Mich.	..	500,000	20,000	25	185,000	June	1868	3 00	460 000	July	1873	1 00	..	....		....		....		....		....		....		.....
Phœnix, c.	Mich.	..	1,000,000	20,000	50	817,500	Sept.	1870	3 00	20,000	Jan.	1876	1 00	..	....		....		....		....		....		....		.....
Quincy, c.	Mich.	..	200,000	20,000	10	....	.....	....	.....	2,130,000	Feb.	1877	4 00	..	....		....		....		....		....		....		.....
Ridge, c.	Mich.	..	500,000	20,000	25	200,000	.....	....	.....	90,000	Feb.	1875	1 00	..	....		....		....		....		....		....		.....
Rockland, c.	Mich.	..	500,000	20,000	25	495,000	Jan..	1874	1 00	....	.....	....	.....	..	....		....		....		....		....		....		.....
Star, c.	Mich.	..	500,000	20,000	25	265,000	Mar.	1876	0 50	....	.....	....	.....	..	....		....		....		....		....		....		.....
Superior, c.	Mich.	..	500,000	20,000	25	340,000	Mar.	1874	0 25	....	.....	....	.....	..	....		....		....		....		....		....		.....

g. Gold. s. Silver. L. Load. c. Copper. * Non-Assessable.

Total Assessments levied to date..... $46,706,310 | Total Sales of coal stocks for the week..... 288,788 shares.
Total Mining Dividends disbursed to date..... 123,546,084 | Total Sales of Mining Shares for the week..... 77,528 do

made the drift was fearfully hot, the heat at the face being 126 degrees Fahrenheit. The benefit derived from such a connection is not instantaneous; on the contrary, when the opening is first made the miners get out of the place as soon as possible, as the heat and smell are such as to be unendurable, and frequently produces asphyxiation. It is the same air that the men breathe before an opening is made, but when it is set in rapid motion it appears to acquire some new and noxious quality. But for this the miners might drill ahead a great number of feet when drifts are being run to make such connections. A drill hole so run, however, would so sicken the men that they would be unable to work. When a connection is made it is desirable, therefore, to knock out as large a hole as possible with the last blast, then retire for some hours until the foul air shall have passed out of the drift and level."

"Good news continue to come in from Tuscarora. Some sulphuret ore of extraordinary richness is being put through the new roasting furnaces of the Grand Prize mine, and the De Frees, adjoining it on the same ledge, is not only turning out a new development of very rich ore, but is shipping bullion to San Francisco. Altogether the outlook, not only on the Comstock, but also throughout the State, is more cheering and hopeful than it has been for several months past."

Mariposa Land and Mining Company.—At a special term of the Supreme Court, held by Judge Dikeman in Brooklyn, the injunction asked for on behalf of Francis B. Wallace, a stockholder in the said company, against Eugene Kelly, Joseph A. Donahue, and the Mariposa Land and Mining Company, was granted. The object of this proceeding is to compel Eugene Kelly & Company to surrender the mortgage held by them in the Mariposa Estate as fraudulent, and to recover the sum of $300,000, money due to the company, from Eugene Kelly & Co., and for $1,000,000 damages.

Sutro Tunnel.—The total length of this work, on the 10th inst., was 18,023 feet. The progress for the month of September was 116 feet. Material in face of header is now in soft ledge porphry, clay, and quartz. Regarding the pending negotiations between the Tunnel Company and the mine owners, the Sacramento *Record Union*, of the 13th inst., says: "The question is now whether the Comstock mines shall compromise with Sutro for the use of the tunnel. At present there is a good deal of reluctance to come down to his terms, but it looks as though the 'Assyrian' had rather the whip-hand of the mine owners. In the event of a refusal on their part he can put in his dam, shut off the escape of all the water now flowing through the tunnel, and await the consequences calmly. What the consequences would be the mining superintendents best know; but we are inclined to think that even the mines which are claimed to be 'quite dry,' and which are therefore said to have no need of the tunnel, might, in such a case, prove to be rather uncomfortable for the miners to work in. Of course it is not difficult to settle the question whether the Comstock can get along without Surto, and from present appearances he intends to settle it by practical experiment, if the mine owners are obstinate. Meantime he will have resort to the courts, and will, no doubt, insist upon all that is 'nominated in the bond,' despite opposition and expostulation."

Assessments with dates when delinquent.—Pennsylvania Gold and Silver Mining Company, Alpine County, Cal., 75 cents per share, delinquent Nov. 22; Golden Chariot, 50 cents, Nov. 8; New York, 40 cents, Nov. 8; De Haro, 15 cents, Nov. 8; Pliocene, 25 cents, Nov. 8; Cabinet Silver Mining Company, 25 cents, delinquent Nov. 12.

The Standard Mining Company of California announces a dividend of $1 per share.

Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, October 19, 1877.

Argentiferous Lead (Base Bullion).—$40@42 per ton for lead; $1.17@$1.18 per ounce for silver; $20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 80 to 120 ounces per ton of 2,000 lb.

The *Inter-Ocean's* correspondent, under date of the 12th inst., says: "The bullion market is weak to-day, and a sale has been made for $40 per ton for lead, and $1.18 per ounce for silver, the lowest price it ever sold for in this market. At these figures somebody is suffering. The shipments of ore and bullion for the week ending October 6 were as follows; Twenty-three cars bullion to Pittsburg, 14 to New York. 4 to Omaha, 2 to Chicago; 2 cars lead ore to Hilliard, 4 to Omaha, Bullion, 906,494 lbs.; lead ore, 120,000 lbs.; total. 1,026,494 lbs.

Gas Stocks.

NEW YORK, FRIDAY EVENING, Oct. 19, 1877.

With the exception of quite an advance in the stock of the Citizens' Gas Company of Brooklyn, we have but little change to note in the quotations of the following list. No sales are reported.

The Public Lamps of New York.—The following table shows the number of lamps at present lighted by the city. The expenditure on this account for the first six months of the present year amounted to $293,128.91:

New York Gas Co	3,013
Manhattan Gas Co	6,557
Metropolitan Gas Co	3,766
Harlem Gas Co	2,016
New York Mutual Gas Co	586
N. Y. and New Jersey Globe Gasoline Co.*	2,108
Central, Westchester Gas Co	1,587
Suburban Gas Co	973
Total	20,606

* It is stated that these lamps do not give general satisfaction. Last week 723 were extinguished by the wind and could not be relit, as only the person employed by the New Jersey Gas Company understands that part of the business. On Wednesday night 120 went out at an early hour, and it is feared that late in the season Harlem will be left on many nights in total darkness. It is said that the lamp-filler does not put in a sufficient quantity of the oil, but whether by his own option or at the direction of the company is not known.

Harlem Gas Company.—We note a recent auction sale of 18 shares of the stock of this company at $99.50 per share.

Gas Works Wanted at Elizabeth, Pa.—The Elizabeth *Herald* of the 12th inst. says: "It has often appeared strange to us that Elizabeth, Allegheny County, was not long ago supplied with a gas works. Situated as she is in the very centre of the region where the best gas producing coal in the world is found, it is, indeed, strange that she does not enjoy the benefit of this by having her streets and houses illuminated by this cheap and brilliant light."

Chico, California, Gas Works.—These works are located in Butte County. The company has a capital stock of $50,000, the works costing $42,000. The gas is made from crude petroleum brought from Ventura County. The company sell daily from eight to ten thousand feet in summer, and from twelve to fifteen thousand feet in winter for which they receive $5 per thousand.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas stocks, No. 30 Broad street, N. Y.

Companies in New York and vicinity.	Capital Stock.	Par.	Dividends. Rate per an.	Am. of last.	Date of last.	Quotat'ns Bid.	As'd
	$						
Mutual, N. Y.	5,000,000	$100	10%	2½	Oct. '77	90	93
" Gold Bonds	90,000	1,000	7%	3½	Feb. '77	100	103
N. York "	4,000,000	....	10%	5	May '77	127	132½
Metrop. "	2,500,000	100	10%	5	June '77	127	130
" " Certf.	1,000,000	....	7%	3½	" "	100	103
" " Bonds	500,000	1,000	7%	3½	" "	102	—
Harlem "	1,850,000	50	8%	3½	Aug. '77	95	100
Manhat. "	4,000,000	50	....‡	5	July '77	198	202
Brooklyn, B'klyn.	2,000,000	52	15%	5	July '77	165	175
Nassau, "	1,000,000	25	....‡	4	July '77	76	80
" " Certf.	700,000	1,000	7%	3½	July '77	98	101
People's, "	1,000,000	10	....‡	3½	July '76	—	45
" " Certf.	300,000	1,000	7%	3½	July '77	80	85
" " B'ds	325,000	....	7%	3	Feb. '77	96	100
Metrop. "	1,000,000	10	5%	2½	May '77	67½	72
Wmsb'rg "	1,000,000	50	10%	2½	July '77	115	122½
" " Certf.	1,000,000	...	7%	3½	July '77	100	102
Citizen's "	1,200,000	20	....‡	4	Jan. '77	77	82½
" " Certf.	320,000	1,000	7%	3½	Oct. '77	97	100
J. C., N. J.	750,000	20	10%	5	July '77	160	—
Cent. Westch. N.Y	466,000	50	7%	4	July '77	80	90
Subur'n " "	295,000	50	7%	3½	Oct. '77	90	100
Municipal, N.Y.	1,500,000	100	....	....	.....	75	85

‡Paid irregularly.

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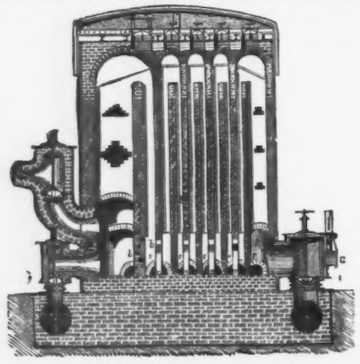

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